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Re: Comments of the Utility Air Regulatory Group on the U.S. Environmental Protection Agency's "Second External Review Draft Integrated Science Assessment for Oxides of Nitrogen, Oxides of Sulfur, and Particulate Matter—Ecological Criteria," EPA-HQ-ORD-2013-0620 and EPA-HQ-OAR-2014-0128

The Utility Air Regulatory Group ("UARG") appreciates this opportunity to comment on the U.S. Environmental Protection Agency's ("EPA" or the "Agency") "Second External Review Draft Integrated Science Assessment for Oxides of Nitrogen, Oxides of Sulfur, and Particulate Matter—Ecological Criteria." 83 Fed. Reg. 29,786 (June 26, 2018) ("ISA").

UARG is a not-for-profit group of individual electric generating companies and national trade associations. UARG participates on behalf of certain of its members collectively in Clean Air Act ("CAA") administrative proceedings that affect electric generators and in litigation arising from those proceedings. The vast majority of electric energy in the United States is generated by individual members of UARG and/or members of UARG's trade association members. These utilities collectively have invested over one hundred billion dollars to reduce emissions of air pollutants regulated under the CAA. According to EPA data, since 1990, electric generators have reduced their emissions of sulfur dioxide and nitrogen oxides by 92 and 84 percent, respectively. This in turn has led to substantial reductions in ambient levels of fine particulate matter and ozone. Electric generators have also cut mercury air emissions by nearly 90 percent since 2006. In addition, data collected by the U.S. Energy Information Administration indicate that electric generators have substantially reduced emissions of carbon dioxide. All of this has been achieved while the U.S. economy and energy consumption have continued to grow.

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EPA jointly reviewed the secondary national ambient air quality standards (“NAAQS”) for oxides of nitrogen (“NO_x”) and oxides of sulfur (“SO_x”) in a proceeding that concluded in 2012. *See* 77 Fed. Reg. 20,218 (Apr. 3, 2012). EPA reviewed the secondary NAAQS for particulate matter (“PM”) in a proceeding that concluded in 2013. *See* 78 Fed. Reg. 3086 (Jan. 15, 2013). In the current proceeding, EPA has opted to jointly evaluate secondary standards for all of these pollutants.

The ISA explains that EPA is conducting a joint review of the secondary NAAQS for NO_x, SO_x, and PM “because they are inter-related through complex chemical and physical atmospheric processes and because they all contribute to nitrogen (N) and sulfur (S) deposition, which in turn contributes to well-documented ecological effects.” ISA at 1. The categories of ecological effects the ISA describes are:

- Gas-phase direct phototoxic effects
- N and acidifying deposition to terrestrial ecosystems
- N and acidifying deposition to freshwater ecosystems
- N deposition to estuarine ecosystems
- N deposition to wetland ecosystems
- S deposition to wetland and freshwater ecosystems
- Other ecological effects of PM

Id. at 22-24. Relying on concepts like ecosystem scale, structure, and function; deposition and source apportionment to ecosystems; critical loads; biodiversity; the effects of reduced versus oxidized forms of N; and the metric developed in the previous secondary NAAQS review, the Aquatic Acidification Index (“AAI”), the ISA concludes that a variety of welfare effects are attributable to N and S deposition. *Id.* at 8-9. For instance, the ISA concludes that N deposition is altering soil biogeochemistry, species richness, and the productivity of terrestrial ecosystems; that S deposition is altering mercury methylation and is causing changes in biota in wetlands and freshwater ecosystems; and that N and S deposition are causing acidification of terrestrial and aquatic ecosystems. *Id.* at 22-24.

The approach EPA is taking in this review of the secondary NAAQS for NO_x, SO_x, and PM and the ecological effects EPA is evaluating are similar in key respects to the 2012 review of the secondary standards for NO_x and SO_x. During the course of the 2012 review, UARG

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explained that EPA's analytical approach was fundamentally flawed and that the ecological effects the Agency was evaluating were improper subjects for a NAAQS. These serious problems have been carried through into this review and are reflected in the second draft ISA. Accordingly, UARG has attached to this letter its key comments from the last review, which set out the case for abandoning the Agency's current approach to this review and addressing the review of the secondary standards for NO_x, SO_x, and PM in a manner that is consistent with the CAA.¹

In those comments, UARG presented three overarching legal and policy arguments for abandoning the concept of a joint secondary standard to address the effects of aquatic acidification. Those arguments were: (1) a secondary NAAQS must specify a nationally uniform level of air quality for each criteria air pollutant; (2) a secondary NAAQS to address acidification would be inconsistent with Title IV of the CAA; and (3) a secondary NAAQS must protect against effects that are "adverse" to public welfare, not against any effect that can be observed. This letter summarizes the key arguments presented in the attached comments and explains how they apply to the ISA.

A Joint Secondary NAAQS Fails To Satisfy the CAA Requirement that Secondary NAAQS Specify a Nationally Uniform Level of Air Quality for Each Criteria Air Pollutant.

As it did during the last review, EPA is assessing the welfare effects associated with NO_x, SO_x, and PM together, often failing to distinguish between effects that can be attributed to each individual pollutant. As noted above, EPA has undertaken this approach because the Agency believes the effects of these pollutants are intertwined and reasonably addressed jointly. This suggests EPA is again considering whether to establish a single joint standard that would apply to all three of these pollutants, as it attempted to do in the 2012 review for NO_x and SO_x.

The joint standard under consideration during the 2012 review was based on an equation called the AAI that related ambient concentrations of NO_x and SO_x to target water quality values. Such a standard would have essentially used tradeoff curves, through which different combinations of ambient NO_x and SO_x could have been used to satisfy the single joint standard. Such an approach would have allowed EPA to reshape the NAAQS from a program

¹ The attached comments are: (1) Comments of the Utility Air Regulatory Group on the Secondary National Ambient Air Quality Standards for Oxides of Nitrogen and Sulfur; Proposed Rule, EPA-HQ-OAR-2007-1145-0136 (Oct. 10, 2011); and (2) Comments of the Utility Air Regulatory Group on the Policy Assessment for the Review of the Secondary National Ambient Air Quality Standards for NO_x and SO_x; Second External Review Draft, EPA-HQ-OAR-2007-1145-0093 (Nov. 26, 2010).

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intended to set minimally acceptable ambient concentration levels for individual criteria pollutants applicable nation-wide into a program that allowed for considerable regional variation in acceptable pollution levels.

Whatever merit such an approach might have scientifically or as a matter of policy, it is not consistent with sections 108 and 109 of the CAA. The CAA states that a secondary NAAQS “shall specify a level of air quality the attainment and maintenance of which in the judgment of the Administrator, based on such [air quality] criteria, is requisite to protect the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutant in the ambient air.” CAA § 109(b)(2). Accordingly, the CAA directs the Administrator to identify a nationally applicable level for each criteria pollutant that is requisite to protect public welfare. The Act simply does not allow differing levels of a pollutant depending on the amount of another pollutant in the air.

During the 2012 review, UARG submitted comments criticizing the joint standard under consideration at that time and calling on EPA to abandon its new approach or at least undertake a traditional review of each individual pollutant alongside its more controversial joint review. EPA declined to take either of those actions. When EPA issued its proposed rule to revise the secondary NAAQS for NO_x and SO_x, it proposed to conclude that EPA lacked sufficient information to develop a defensible joint standard, and instead EPA proposed to revise the secondary standards to set them at levels equivalent to the primary NAAQS for NO_x and SO_x. UARG commented that, by focusing exclusively on science, risks, and policy issues relevant to a potential joint standard, EPA had not established a record that could support such a revision to the individual standards for NO_x and SO_x. EPA could find itself in a similar position at the conclusion of this review if the agency does not expand its examination of the effects on NO_x, SO_x, and PM on an individual pollutant basis.²

A Secondary Standard Designed To Address Acidification Is Inconsistent with Title IV of the CAA, and the Other Welfare Effects Evaluated in the ISA Are Ill-Suited To Being Addressed Through a National Standard.

During the 2012 review, EPA focused primarily on factors relevant to setting a standard that would protect against aquatic acidification as a result of deposition of airborne N and S. Such a standard, however, disregards factors indicating that the CAA precludes an acidification-based NAAQS. Congress has taken a number of specific actions to address acidification, all outside of the NAAQS program. In 1980, Congress created the National Acid Precipitation Assessment Program (“NAPAP”) to investigate the causes and effects of acidification and to

² To evaluate the effects of NO_x and the impact various NO_x standards might have, EPA should also delineate between effects attributable to ambient NO_x and effects attributable to reduced nitrogen and PM. See ISA at 17-18.

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evaluate potential methods for controlling acidification. Based on NAPAP findings, Congress enacted Title IV, establishing the Acid Rain Program, which included a market-based allowance trading program for sulfur dioxide (“SO₂”) and NO_x emission rate limits for regulated facilities. CAA §§ 401-416. The specific legislative provisions addressing acidification resulting from N and S deposition should be viewed as supplanting any general authority EPA might otherwise have been able to claim to address acidification under sections 108 and 109 of the CAA. *See Flourco Glass Co. v. Transmirra Products Corp.*, 353 U.S. 222, 228 (1957).

Section 404 of the 1990 Clean Air Act Amendments provides further support for the conclusion that any additional acid deposition-based standard would require congressional authorization. It requires EPA to evaluate and report to Congress on the feasibility of creating additional acidification-related standards, including information on how such standards should be designed and how to integrate them into the existing CAA. In particular, section 404 asked EPA to compare the costs of and impediments to developing additional acidification-related standards to those of the NAAQS program. The legislative history of the 1990 amendments confirm that understanding, describing the need for measures beyond the current CAA to address acidification and the Acid Rain Program as targeted authority to address acidification. S. Rep. No. 101-228 at 28990, 302 (1989). Reading these provisions and the legislative history together, it is clear that Congress did not believe the existing secondary NAAQS were an appropriate tool for addressing acidification. And, until the 2012 review, that was EPA’s consistent position. *See, e.g.*, 58 Fed. Reg. 21,351, 21,356 (Apr. 21, 1993) (“Congress does not seem to have expected that the EPA would set a secondary standard for acidic deposition. . . .”).

When EPA previously considered whether to attempt to address acidification through a secondary NAAQS, it did not focus on the preclusive effect of Title IV. Instead, the Agency evaluated whether a secondary standard was the appropriate tool for addressing that welfare effect. In rulemaking proceedings conducted in 1992 and 1996, EPA twice concluded that acidification should not be subject to a secondary NAAQS because the NAAQS “were not well designed to address regional air pollution problems.” 58 Fed. Reg. at 21,356; 61 Fed. Reg. 52852, 52855 (Oct. 8, 1996) (“Given the multiple causes and regional character of these [acidification] problems, the Administrator also concludes that adoption of a nationally-uniform secondary standard would not be an effective approach to addressing them.”). The welfare effects discussed in the ISA in addition to acidification, such as eutrophication and mercury methylation, are also regional problems that vary considerably from location to location. For that reason, EPA should reevaluate whether the welfare effects addressed in the ISA are the proper subjects of national standards and revise its approach to the review of the standards for NO_x, SO_x, and PM as appropriate.

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A Secondary NAAQS Must Protect Against Effects that Are Determined by the Administrator To Be “Adverse” to Public Welfare.

Section 109(b)(2) of the CAA requires the Administrator to set a NAAQS at the level he determines is “requisite to protect the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutant in the ambient air.” CAA § 109(b)(2). Although the ISA is not a proper vehicle for making determinations as to which effects are or are not adverse, the scientific information presented in the ISA should adequately describe the nature of the available studies and data to help inform adversity considerations at the appropriate time.

A number of the concepts and categories of information relied upon in the ISA have the potential to complicate adversity assessments. Assessment of studies that are based on or evaluate critical loads, biodiversity, the effects of reduced versus oxidized forms of N, and questions related to ecosystem scale and ecosystem services pose particular problems. *See* ISA at 8-9 (identifying key concepts for the ISA).

Critical loads, as the ISA explains, are defined as “a quantitative estimate of an exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge.” *Id.* at 12 (internal quotes and citation omitted). The definition of the critical load concept itself demonstrates the problems associated with relying on critical load studies. The concept is imbued with policy judgments as to adversity. These judgments are being made by investigators, not by the Administrator, to whom the Act gives that responsibility in the NAAQS context. Indeed, the ISA further notes that critical loads may vary for even a single location because studies may not agree on the definition of harm or because the studies may evaluate different welfare endpoints. *Id.* at 14. The ISA should evaluate and provide information as to all of the policy-based judgments underlying the critical load studies it identifies. In the absence of such information, there is no reasonable way for the Administrator to make the adversity judgments that the Act requires of him based on those studies.

Biodiversity concepts also pose challenges for use in a NAAQS review. The ISA generally explains that biodiversity losses can be harmful because they can impact the relationship between prey and predators, alter species composition, impact algal blooms and disease transmission, and affect ecosystem services on which humans rely. *Id.* at 16-17. The meaning of the term biodiversity is not adequately defined, and the ISA in general does not provide sufficient information to help distinguish between biodiversity losses that may be of concern and those that might not give rise to disturbances in ecosystem services or other potentially adverse outcomes.

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Issues related to ecosystem scale and ecosystem services raise similar questions. As the ISA explains, ecosystems may be composed of a small pond or be as large as the 1,700 square mile Great Salt Lake. *Id.* at 9. How should a nationally applicable set of standards incorporate information that applies across such widely varying geographic scales? How does one distinguish between ecosystem changes that are “undesirable” or “important” from changes that do not rise to such a level? *Id.* at 10 (“Ecosystem changes are often considered undesirable if important structural or functional components of the ecosystems are altered following pollutant exposure”).

Similarly, there are significant questions with respect to data representativeness that must be addressed before determinations about adversity to public welfare can reasonably be made. For instance, the ISA explains that there is considerable variation in N and S deposition geographically and temporally. *Id.* at 30-32. Further, different soils, water bodies, species, and other welfare resources have widely varying responses to N and S inputs. *Id.* at 42. In some instances, such as with sensitivity to N eutrophication, similar variations in response are suspected but have not been identified. *Id.* at 42. Finally, to provide the Administrator with the information needed to make informed determinations as to whether various effects are adverse to the public welfare, the ISA must address uncertainties more thoroughly. The current draft of the ISA describes uncertainty concepts generally, *id.* at 101-110, and states that quantified uncertainty values will be calculated in the Risk and Exposure Assessment “as previously scoped” by EPA. *Id.* at 102. Deferring a more rigorous uncertainty analysis until preparation of the Risk and Exposure Assessment calls into question the reliability of the conclusions that are presented in the ISA, including all of the ISA’s causality determinations. EPA should include an appropriate level of uncertainty analysis in the ISA in addition to any work the Agency undertakes in subsequent documents produced during the course of this review.

Because of the issues identified herein, including the legal problems posed by the development of a joint standard and a standard intended to address acidification and other regional welfare issues, UARG encourages EPA to make a significant change in course as it continues with this proceeding. In particular, EPA should attempt to correct the issues identified in these comments as it develops the first draft of its Risk and Exposure Assessment. That document would also be an appropriate vehicle for presenting a quantified uncertainty analysis to better demonstrate the limitation of many of the key studies described in the ISA.

Sincerely,

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Attachment 1

**COMMENTS OF THE UTILITY AIR REGULATORY GROUP
ON THE
SECONDARY NATIONAL AMBIENT AIR QUALITY
STANDARDS FOR OXIDES OF NITROGEN AND SULFUR

PROPOSED RULE
AUGUST 1, 2011**

DOCKET ID No. EPA-HQ-OAR-2007-1145

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OCTOBER 10, 2011

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**COMMENTS OF THE UTILITY AIR REGULATORY GROUP
ON THE
SECONDARY NATIONAL AMBIENT AIR QUALITY STANDARDS
FOR OXIDES OF NITROGEN AND SULFUR
PROPOSED RULE
(AUGUST 1, 2011)**

DOCKET ID No. EPA-HQ-OAR-2007-1145

OCTOBER 10, 2011

I. Introduction

On August 1, 2011, the United States Environmental Protection Agency (“EPA” or “Agency”) published a proposed rule in the Federal Register that would revise the secondary national ambient air quality standards (“NAAQS” or “standards”) for oxides of nitrogen (“NO_x”) and oxides of sulfur (“SO_x”). 76 Fed. Reg. 46084 (Aug. 1, 2011). EPA’s proposed rule would retain the current nitrogen dioxide (“NO₂”) and sulfur dioxide (“SO₂”) secondary standards to protect against the direct effects on vegetation resulting from exposure to gaseous NO_x and SO_x. Additionally, EPA proposes to add secondary standards identical to the NO₂ (100 ppb) and SO₂ (75 ppb) primary 1-hour standards to provide additional protection against the effects of nitrogen and sulfur deposition, specifically aquatic acidification.

EPA’s proposed revision of the secondary NO_x and SO_x standards is a substantial departure from the regulatory action that the Agency has contemplated since it initiated this rulemaking process in December 2005.¹ In the three scientific and technical documents

¹ See 70 Fed. Reg. 73236 (Dec. 2005); *see also* EPA, Integrated Review Plan for the Secondary National Ambient Air Quality Standards for Nitrogen Dioxide and Sulfur Dioxide (Dec. 2007).

supporting this review,² EPA assessed the scientific basis for establishing a joint secondary standard to address deposition-related aquatic acidification effects and devised a technical mechanism, a complex equation called the Aquatic Acidification Index (“AAI”), in an attempt to relate atmospheric concentrations of NO_x and SO_x to aquatic acidification effects, which depend not only on deposition rates but on numerous ecosystem characteristics that determine relative sensitivity to nitrogen and sulfur-related acidification. This AAI-based NAAQS would have required EPA to select a target water quality value and use an equation to calculate allowable NO_x and SO_x concentrations. EPA staff identified acid neutralizing capacity (“ANC”) as this “ecological indicator” for water quality. As EPA further explains,

[t]he ecological indicator [ANC] ... is related to atmospheric deposition through biogeochemical ecosystem models ..., which associate a target deposition load to a target ecological indicator. Once a target deposition is established, associated allowable air concentrations are determined ... through the relationships between concentration and deposition that are embodied in air quality models such as CMAQ.

76 Fed. Reg. at 46113. Under the AAI, it appears that the Agency would have divided the nation into ecoregions and then categorized each such region as “sensitive” or “relatively non-acid sensitive,” implying without justification that there are, in fact, no areas of the country that are non-sensitive. *Id.* at 46120. EPA staff recommended protecting between 70 and 90% of waterbodies (with data) in sensitive regions and 50% of waterbodies (with data) in less sensitive regions. *Id.* at 46124. Under the AAI approach, EPA would then apparently have calculated an allowable range of ambient NO_x and SO_x concentrations, a range that would vary from

² Integrated Science Assessment for Oxides of Nitrogen and Sulfur -- Ecological Criteria (Dec. 2008) (hereinafter “ISA”); Risk and Exposure Assessment for Review of the Secondary National Ambient Air Quality Standards for Oxides of Nitrogen and Oxides of Sulfur -- Final Report (Sept. 2009) (hereinafter “REA”); Policy Assessment for the Review of the Secondary National Ambient Air Quality Standards for Oxides of Nitrogen and Oxides of Sulfur (Feb. 2011) (hereinafter “PA”).

ecoregion to ecoregion, that would ostensibly lead to waterbodies in those regions, at some point in time, achieving a nationally uniform target ANC value, which EPA staff recommended be set between 20 and 75 µeq/L. *Id.* at 46126.

Although expressing concern about the adequacy of the current standards to protect against the acidifying effects of NO_x and SO_x deposition, the Administrator proposes to find that the limitations and uncertainties associated with the conceptual joint AAI-based standard renders it “premature to set a new, multi-pollutant secondary standard for oxides of nitrogen and sulfur at this time.” *Id.* at 46135.

In the face of these uncertainties, the Administrator proposes “that the Agency should undertake a Field Pilot Program to gather additional data” that would be considered in a future rulemaking. *Id.* at 46135. The proposed addition of 1-hour NO_x and SO_x standards, set equivalent to the primary NAAQS for each pollutant, is premised on the assertion that they would, in the absence of an AAI-based NAAQS, “directionally benefit the environment by reducing NO_y and SO_x deposition to sensitive ecosystems.” *Id.*

The Utility Air Regulatory Group (“UARG”)³ is pleased to offer the following comments on EPA’s proposed secondary NAAQS for NO_x and SO_x. As explained more fully below, UARG concurs with the Administrator’s judgment not to promulgate a standard using the AAI. UARG has submitted comments during each phase of this NAAQS review that have questioned the propriety and lawfulness -- as well as the inadequate scientific and technical bases -- of the joint AAI-based standard as EPA has developed this potential revision of the secondary NO_x and

³ UARG is a voluntary, ad hoc, nonprofit group of individual electric generating companies and industry trade associations. UARG’s purpose is to participate on behalf of its members collectively in EPA’s rulemaking and other Clean Air Act proceedings that affect the interests of electric generators, and in related litigation. Since 1977, UARG has participated in virtually all key rulemakings, related litigation, and other arenas of policy development under the Clean Air Act that affect electric generating companies.

SOx standards.⁴ Moreover, as UARG has maintained throughout this NAAQS review process, EPA's concept for a joint secondary NOx and SOx standard, as described in the ISA, REA, and PA, is simply inconsistent with the Clean Air Act ("CAA" or "Act"). Accordingly, no amount of additional research will be sufficient to justify the future promulgation of such a standard. Regardless, the Field Pilot Program described in EPA's proposal cannot produce information adequate to support a joint AAI-based NAAQS even if such a standard were legal.

On the other hand, the form of the revisions EPA is proposing at this time is potentially consistent with the CAA, at least in concept. Indeed, throughout EPA's review of the NOx and SOx secondary NAAQS, UARG pressed the Agency to evaluate a standard with traditional NAAQS elements. EPA has, however, failed to undertake such an assessment. EPA cannot now set such a standard without having conducted scientific and technical analyses sufficient to support the Agency's decision. The record on which the Agency relies is silent as to the effect that the proposed 1-hour standards would have on the welfare values EPA is seeking to protect.

⁴ Comments of the Utility Air Regulatory Group on the Policy Assessment for the Review of the Secondary National Ambient Air Quality Standards for NOx and SOx: Second External Review Draft, Docket ID No. EPA-HQ-OAR-2007-1145-0093; Comments of the Utility Air Regulatory Group on the Policy Assessment for the Review of the Secondary National Ambient Air Quality Standards for NOx and SOx: First External Review Draft, Docket ID No. EPA-HQ-OAR-2007-1145-0070.1; Comments of the Utility Regulatory Group on the Second Draft of the Risk and Exposure Assessment for Review of the Secondary National Ambient Air Quality Standards for Oxides of Nitrogen and Oxides of Sulfur, Docket ID No. EPA-HQ-OAR-2007-1145-0061.1; Comments of the Utility Air Regulatory Group on the Risk and Exposure Assessment for Review of the Secondary National Ambient Air Quality Standards for Oxides of Nitrogen and Oxides of Sulfur -- Environmental Criteria (First External Review Draft), Docket ID No. EPA-HQ-OAR-2007-1145-0051.1; Comments of the Utility Air Regulatory Group on the Integrated Science Assessment for Oxides of Nitrogen and Sulfur -- Environmental Criteria (Second External Review Draft), Docket ID No. EPA-HQ-OAR-2007-1145-0050.1; Comments of the Utility Air Regulatory Group on the Integrated Science Assessment for Oxides of Nitrogen and Sulfur -- Environmental Criteria (First External Review Draft) and on the Draft Scope and Methods Plan for Risk/Exposure Assessment: Secondary NAAQS Review for Oxides of Nitrogen and Oxides of Sulfur, Docket ID No. EPA-HQ-OAR-2007-1145-0025.1.

The record, therefore, does not support the promulgation of the 1-hour secondary NAAQS for SO₂ and NO₂ that EPA has proposed. UARG therefore urges EPA simply to reaffirm the existing standards.

II. Legal Standards and Process Governing the Review of the Secondary NAAQS for NO_x and SO_x.

Sections 108 and 109 of the CAA require the promulgation and periodic review of the NAAQS and provide the basic framework for these processes. Under section 108(a)(2), the NAAQS establishment process begins when the Administrator lists a pollutant as a “criteria air pollutant.” Listing is appropriate when: (1) the Administrator determines that emissions of the pollutant “cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare,” (2) she determines that the presence of these emissions in the ambient air “results from numerous or diverse mobile or stationary sources,” and (3) she intends to prepare air quality criteria for the pollutant. CAA § 108(a)(1).

The Act directs the Administrator to prepare “air quality criteria” for each listed pollutant. Air quality criteria are required to “accurately reflect the latest scientific knowledge useful in indicating the kind and extent of all identifiable effects on public health or welfare which may be expected from the presence of such pollutant in the ambient air, in varying quantities.” *Id.* § 108(a)(2). The information contained in these criteria documents serves as EPA’s scientific basis for setting (1) a “primary” NAAQS at the level that, in the Administrator’s judgment, is requisite to protect the public health with an adequate margin of safety, *id.* § 109(b)(1), and (2) a “secondary” NAAQS at the level that, in the Administrator’s judgment, is requisite to protect the public “welfare” from known or anticipated adverse effects, *id.* § 109(b)(2).

The Act further requires the Administrator to review the “air quality criteria” and the NAAQS not less frequently than every five years and to “make such revisions in such criteria and standards and promulgate such new standards as may be appropriate in accordance with [CAA § 108 and CAA § 109(b)].” *Id.* § 109(d)(1). Revisions to the NAAQS are appropriate only if the NAAQS are no longer at the level requisite to protect public health or welfare, *i.e.*, they are either higher or lower than necessary to provide the required level of protection. *See Whitman v. Am. Trucking Ass’ns*, 531 U.S. 457, 475-76 (2001).

NO_x and SO_x have both been the subject of primary and secondary NAAQS since 1971, and, of relevance here, the individual secondary standards for each pollutant have undergone review pursuant to CAA §§ 108 and 109.⁵ In the current review,⁶ EPA considered revisions to

⁵ EPA last completed a review of the secondary NAAQS for NO_x in 1996. 61 Fed. Reg. 52,852 (Oct. 8, 1996). EPA’s current secondary NAAQS for NO_x (using the indicator NO₂) is an annual arithmetic mean standard of 0.053 ppm. 40 C.F.R. § 50.11 (2010). The last review of the secondary NAAQS for SO_x was completed in 1993. 58 Fed. Reg. 21351 (Apr. 21, 1993). The current secondary NAAQS for SO₂, the indicator for SO_x, is a 3-hour standard of 0.5 ppm, not to be exceeded more than once per calendar year. 40 C.F.R. § 50.5(a) (2010).

⁶ This review was conducted pursuant to a process that builds upon the basic NAAQS review requirements as stated in §§ 108 and 109. The revised process, described in guidance from the Administrator, recasts the “air quality criteria” as an Integrated Science Assessment, which contains a “concise evaluation, integration and synthesis of the most policy-relevant science,” and is “supported by a more detailed and comprehensive science assessment support document.” Memorandum from Marcus Peacock, Deputy Administrator, to Dr. George Gray, Assistant Administrator, Office of Research and Development, & Bill Wehrum, Acting Assistant Administrator, Office of Air and Radiation at 2 (Dec. 7, 2006) (Process for Reviewing National Ambient Air Quality Standards). In addition, EPA staff prepares a risk/exposure analysis that focuses on “key results, observations, and uncertainties” and that “ensure[s] the characterization of risk and exposure are informed by the clearest possible understanding of the available scientific information.” *Id.* Following this and prior to the Administrator’s proposal of any regulatory changes to an existing NAAQS, EPA staff prepares a “policy assessment document,” which “integrates and interprets” information from the science and risk documents to “frame policy options for consideration by the Administrator,” based on a “transparent staff analysis” of the scientific basis for those options. Memorandum from Lisa P. Jackson to Elizabeth Craig, Acting Assistant Administrator for Air and Radiation, & Lek Kadel, Acting Assistant Administrator for Research and Development (May 21, 2009). EPA has completed each of these steps in this NAAQS review.

the NO_x and SO_x standards in a joint proceeding, leading EPA staff to recommend adoption of a single secondary NAAQS applicable to both pollutants, an approach that the Administrator has proposed not to adopt at this time. 76 Fed. Reg. at 46089.

III. A Secondary NAAQS Intended To Address Acidification Is Inconsistent with Title IV of the CAA.

As noted above, EPA's proposed 1-hour NO_x and SO_x standards and its concept for an AAI-based NAAQS are intended to address the role of ambient NO_x and SO_x in deposition-related aquatic acidification. Although aquatic acidification and any ecosystem impacts that might result from it might otherwise be considered the sort of impacts that could reasonably be construed to constitute effects on public welfare, Congress has foreclosed the secondary NAAQS program as a regulatory avenue for addressing acidification. EPA's proposed revisions to the NO_x and SO_x NAAQS or an AAI-based NAAQS are, therefore, both unlawful.

EPA cannot use the secondary NAAQS to address acidification for two basic reasons: (1) the CAA addresses acidification exclusively through Title IV of the CAA and, (2) Congress has, via statute, precluded an acidification-based air quality standard. Indeed, EPA has previously recognized these congressional actions as preventing the establishment of an acidification-based NAAQS.

Congress has taken a number of significant steps related to acidification caused by NO_x and SO_x deposition. In 1980 -- well after the inception of the NAAQS program -- Congress enacted the Acid Precipitation Act of 1980, which created the National Acid Precipitation Assessment Program ("NAPAP"). 42 U.S.C. §§ 8901-8912. At that time, scientific understanding of the role of NO_x and SO_x in contributing to acidification and the effects of that acidification were in only in their infancy. The NAPAP program was, therefore, designed to identify the causes and sources of acid rain; to evaluate its environmental, social, and economic

effects; and to assess potential methods of control. 42 U.S.C. § 8903. As enacted, the program operated for ten years and produced a number of reports, including a final report in 1990. *See* 76 Fed. Reg. at 46087. Subsequently, Congress extended the program. *See* CAA § 103(j).

Based, in part, on the findings generated by the NAPAP program, Congress took further action to address NO_x- and SO_x-related acidification. It enacted Title IV of the Clean Air Act Amendments of 1990 (“1990 Act”), establishing the Acid Rain Program. Pub. L. No. 101-549, 104 Stat. 2399, 2584-2634 (Nov. 15, 1990); CAA §§ 401-416. Title IV requires substantial reductions of SO₂ and NO_x emissions, achieved, in the case of SO₂, through a market-based allowance trading program and, in the case of NO_x, through defined emission rate limits imposed on regulated facilities. CAA §§ 403-406 (SO₂ program); CAA § 407 (NO_x program). As such, it reflects Congress’ considered determination of the appropriate balance between protection against acidification and economic considerations.

The existence of a specific regulatory program crafted by Congress to address directly NO_x- and SO_x-related acidification supplants, under the law, any general authority found elsewhere in the CAA that could be interpreted, as EPA has attempted to do here, to authorize additional regulation to address such acidification. This principle -- that the specific terms of a statute override the general terms -- is so well-established that it is counted among the most basic canons of statutory construction. Indeed, the U.S. Supreme Court has stated “[h]owever inclusive may be the general language of a statute, it will not be held to apply to a matter specifically dealt with in another part of the same enactment.” *Fourco Glass Co. v. Transmirra Products Corp.*, 353 U.S. 222, 228 (1957) (citations omitted); *see also United States v. Estate of Romani*, 523 U.S. 517, 532 (1998) (later, more specific statute governs); *FDA v. Brown & Williamson Tobacco Corp.*, 529 U.S. 120, 160 (2000) (the FDA could not regulate tobacco under

its general authority because Congress had enacted subsequent tobacco-specific legislation that did not permit a ban of the product).

EPA's current interpretation of its authority under the NAAQS program flouts this fundamental principle of statutory interpretation. Indeed, in the proposed rule, EPA seeks to support its authority to issue an acidification-focused secondary NAAQS by noting that the 1990 Act, while adding the Acid Rain Program to specifically address NO_x- and SO_x-related acidification, also amended the definition of "welfare" as it relates to the secondary NAAQS program. The proposal states:

the 1990 Amendments also added new language to sections of the CAA pertaining to the scope and application of the secondary NAAQS designed to protect the public welfare. Specifically, the definition of "effects on welfare" in Section 302(h) was expanded to state that the welfare effects include effects "* * * whether caused by transformation, conversion, or combination with other air pollutants."

76 Fed. Reg. at 46087. The proposal then goes on to cite a 1999 rulemaking petition from seven Northeastern States requesting that EPA rely on this amended definition as a basis for issuing secondary NAAQS to address acidification. *Id.* at 46088. The receipt of a rulemaking petition is hardly evidence that EPA has regulatory authority to take a specific action, and interpreting the very general language of the welfare definition amendment as an authorization to supplant the highly specific Acid Rain Program is simply unreasonable. The Agency has misinterpreted the CAA and, as a result, cannot now or in the future pursue a NAAQS revision to address aquatic acidification.⁷

The Agency's error in considering a secondary NAAQS for NO_x and SO_x based on acidification effects is even more apparent when viewed in light of another crucial provision of

⁷ As discussed below, this misreading is also inconsistent with the Agency's prior interpretation of the law.

the 1990 Act, § 404. Section 404 required EPA to report to Congress on the feasibility of developing an acid deposition standard and the actions that would be required to integrate such a program into the CAA. 104 Stat. at 2632; CAA § 401 note (citations hereinafter to 1990 Act § 404). Specifically, § 404 states:

[T]he Administrator of the Environmental Protection Agency shall transmit to the Committee on Environment and Public Works of the Senate and the Committee on Energy and Commerce of the House of Representatives a report on the feasibility and effectiveness of an acid deposition standard or standards to protect sensitive and critically sensitive aquatic and terrestrial resources. The study required by this section shall include, but not be limited to, consideration of the following matters:

- (1) identification of the sensitive and critically sensitive aquatic and terrestrial resources in the United States and Canada which may be affected by the deposition of acidic compounds;
- (2) description of the nature and numerical value of a deposition standard or standards that would be sufficient to protect such resources;
- (3) description of the use of such standard or standards in other Nations or by any of the several States in acid deposition control programs;
- (4) description of the measures that would need to be taken to integrate such standard or standards with the control program required by title IV of the Clean Air Act;
- (5) description of the state of knowledge with respect to source-receptor relationships necessary to develop a control program on such standard or standards and the additional research that is ongoing or would be needed to make such a control program feasible; and
- (6) description of the impediments to implementation of such control program and the cost-effectiveness of deposition standards compared to other control strategies including ambient air quality standards, new source performance standards and the requirements of title IV of the Clean Air Act.

1990 Act § 404.

A close reading of § 404 demonstrates that Congress did not intend EPA to establish regulatory programs to redress acidification related to NO_x and SO_x deposition through any of the Agency's authorities other than the Title IV program specifically designed for such purposes. First, § 404 indicates that Congress itself wanted information on whether an additional acid deposition standard was necessary. The only reason for such a request is that such information would allow *Congress* to decide whether to create such a program. Second, Congress requested specific information about appropriate levels and forms for additional acidification-based regulation, information that would have been critical to the legislature itself only if the Congress were designing the contours of a regulatory program. Third, Congress requested information about the design of non-federal acid deposition programs and information related to how new federal regulation could be integrated with the CAA. This can only be understood as an indication that Congress believed an amendment to the CAA would be necessary before additional acidification-based regulatory action would be authorized. Finally, § 404 directs EPA to describe the impediments and costs of an additional acidification program and to compare such hurdles to those faced under the NAAQS program, again indicating that Congress viewed the NAAQS as a foreclosed regulatory approach.

The only reasonable conclusion is that Congress enacted this language into law based on the premise that the NAAQS program was not available for purposes of regulating acidification. And where Congress premises an amendment enacted into law on an interpretation of an existing statute, that interpretation is controlling. *See, e.g., Merrill Lynch, Pierce, Fenner & Smith v. Curran*, 456 U.S. 353, 382-87 (1982). Indeed, even EPA, in its proposed rule, acknowledges that “Congress considered that further action might be necessary in the long term to address any problems remaining after implementation of the Title IV program and, *reserving judgment on the*

form that action could take, included Section 404 of the 1990 Amendments” 76 Fed. Reg. at 46087 (emphasis added). By this action, Congress did not simply refrain from exercising its authority, it reserved to itself the prerogative as to whether or not to take any action at all.

The legislative history of the 1990 Act confirms that Congress intended the Acid Rain Program to be the only source of authority for regulation of acidification barring further legislation. H. Rep. No. 101-490 at 157 (1990) states that “[t]he Clean Air Act was originally designed mainly to reduce high pollution levels that tend to occur near major pollution sources. It did not contemplate that long-distance transport of air pollutants could cause widespread adverse impacts.”⁸ This report further indicates that as a result of Congress’ concern over the problems posed by acidic deposition, and due to the fact that the CAA was not designed to address it, the 1990 Act “includes a new national program” to regulate SO_x- and NO_x-related acidic deposition. *Id.* at 158.

The Senate Report on the 1990 Act, in a section entitled “Need for measures beyond the current Clean Air Act,” adopts an EPA analysis concluding that the Agency did not have authority under the NAAQS program to address NO_x and SO_x-related acidic deposition. S. Rep. No. 101-228 at 289-90 (1989) (“Some have suggested that the existing law is adequate to deal with interstate air pollution. The most persuasive argument that it is not, is the EPA’s own analysis of the options available under existing law.”). Because Congress determined that the Agency lacked authority to regulate acidification caused by NO_x and SO_x deposition, it enacted Title IV “for the express purpose of reducing the emission, transport, transformation and deposition of acid rain precursors, sulfur dioxide and oxides of nitrogen.” *Id.* at 302. The

⁸ While the CAA has been amended to address some long-range transport-related issues, long-range transport related to acidifying deposition is properly controlled under Title IV alone.

legislative history, therefore, confirms that Congress viewed Title IV as the sole authority for regulatory action to address acidification.

Indeed, if EPA's new interpretation of its authority were correct, these reports should have indicated that Congress amended the 302(h) definition of welfare for the express purpose of addressing acidification. Clearly, that was not what Congress intended. Moreover, had Congress intended in amending § 302(h) to authorize regulation of NO_x- and SO_x-related acidification pursuant to the secondary NAAQS program, it stands to reason that Congress would have also amended the secondary NAAQS program so as to reform what Congress and EPA both concluded was a program that was not designed to handle an issue with the specific features of acidification. Congress did nothing to reconfigure the operation of the secondary NAAQS in this manner. Thus, it cannot have intended that EPA proceed with acidification-based regulation of NO_x and SO_x.

EPA's past interpretations of its authority under the secondary NAAQS program are consistent with this view. The Agency previously made the following statements:

- “[B]oth bodies of Congress . . . *conclude[d] that a new legislative program was needed* to address acidic deposition effects despite significant uncertainties concerning underlying scientific data and arguments over whether the EPA could address the acidic deposition problem under existing law.” 58 Fed. Reg. 21351, 21356 (April 21, 1993) (emphasis added).
- “The 1990 Amendments and the legislative history indicate, however, that Congress *reserved judgment* as to whether further action might be necessary or appropriate in the longer term and, if so, what form it should take. *Congress seems to have viewed these as questions it would itself address in the future*, based on further studies and research to be conducted by the EPA and other agencies. Consistent with the 1988 proposal notice, *Congress does not seem to have expected that the EPA would set a secondary standard for acidic deposition ... in the interim*. To the contrary, in section 404 of the 1990 Amendments, Congress specifically required the EPA to conduct a study of the feasibility and effectiveness of an acid deposition standard or standards, and to report to Congress by November 15, 1993 on the role that a deposition standard might play in supplementing the acidic deposition control program adopted in title IV, and

what measures would be needed to integrate it with that program.” *Id.* (emphasis added) (citation omitted).

- “Based on its review of options, the Administration had concluded that existing authorities under the Act, including those for secondary NAAQS and the associated implementation process, *were not well designed to address regional air pollution problems, especially those involving long-range transport of pollutants and their transformation products. The President accordingly decided that a comprehensive program aimed at reducing SO₂ emissions ... would be the best way to afford increased protection [from acidification].*” 58 Fed. Reg. at 21356 (emphasis added).
- “Congress *reserved judgment* regarding the possible need for further action to control acid deposition beyond the provisions of title IV of the 1990 Amendments and what form any such action might take.” 60 Fed. Reg. 52,874, 52,884/2 (Oct. 11, 1995) (citing § 404 of the 1990 Act) (emphasis added).
- “[T]he available scientific and technical evidence assessed in the [Criteria Document and Staff Paper] does not provide an adequate basis for setting a separate secondary standard for [nitrogen dioxide] to address the effects associated with nitrogen deposition on acidification of freshwater bodies and eutrophication of estuaries and coastal waters. *Given the multiple causes and regional character of these problems, the Administrator also concludes that adoption of a nationally-uniform secondary standard would not be an effective approach to addressing them.*” 61 Fed. Reg. 52852, 52855 (Oct. 8, 1996) (emphasis added).

The bases for these statements are reflected in EPA’s 1995 report in response to § 404. Acid Rain Div., U.S. EPA, Acid Deposition Standard Feasibility Study: Report to Congress (1995) [hereinafter “404 Study”]. The 404 Study provided an assessment of different methods for regulating acidifying deposition effectively. Tellingly, none of the approaches the Agency concluded was feasible bore any resemblance to a secondary NAAQS. Although the 404 Study did not include a definitive statement, like those quoted above, that the Agency lacked authority to regulate acidification under other authorities, it concluded that “clear direction from Congress in this area would certainly make implementation more feasible and effective.” *Id.* It further noted that the “uncertainties” of the NAAQS program would not be “conducive” to the sort of planning required for acidification-related regulation. *Id.* at 101.

In sum, Congress enacted a comprehensive program specifically designed to address NO_x- and SO_x-related acidification. A general authorization to address welfare effects is not sufficient to overcome the presumption against reading general statutory authorizations to supersede more specific enactments. Further, § 404 confirms that Congress intended any additional regulation of acidification to be addressed by the legislature and did not leave the matter to EPA discretion. The legislative history of the 1990 Act supports this interpretation of the law, and, until this NAAQS review, EPA's interpretation of its authority under the secondary NAAQS program to address acidification was consistent with all of these positions. EPA's proposed revision to the NAAQS as well as its AAI-based standard are both intended to address acidification and are therefore inconsistent with the law.

IV. The Record EPA Has Developed Does Not Support the Agency's Proposed Revision of the Secondary NAAQS for NO_x and SO_x.

As noted above, EPA is proposing to retain the current secondary NAAQS for NO_x and SO_x⁹ and to supplement those standards with an additional set of secondary NAAQS set equivalent to the primary NAAQS for NO₂ and SO₂. The basis for the proposed supplemental standards is, at best, difficult to understand. It seems, for instance, to contradict many of the Administrator's findings presented elsewhere in the proposed rule, and it is a decision without foundation in the rulemaking record.

Despite proposing these revisions, the Administrator states that “the new NO₂ and SO₂ primary 1-hour standards set in 2010 ... [are] not ecologically relevant for a secondary standard....” 76 Fed. Reg. at 46135. By this, the Administrator apparently means that the structure of the primary NAAQS fails to target and meaningfully impact the ecological effects

⁹ The proposed rule states that “there is very limited new research on phytotoxic effects,” resulting from direct exposure to NO_x and SO_x. 76 Fed. Reg. at 46091. UARG agrees with this assessment and concurs with EPA's proposed determination that the secondary NAAQS for NO_x and SO_x should not be revised to address such effects.

that EPA staff has recommended that the secondary NAAQS for NO_x and SO_x address. Indeed, this seems clear from the Administrator's description of the reasons why the current secondary NAAQS are not sufficiently protective:

The current standards are not directed toward depositional effects, and none of the elements of the current NAAQS—indicator, form, averaging time, and level—are suited for addressing the effects of nitrogen and sulfur deposition.

Id. at 46106.

Although UARG does not agree that the structure of EPA's concept for an AAI-based standard is an appropriate remedy to the shortcomings that EPA identifies, UARG notes that the record does not indicate that one-hour SO₂ and NO₂ NAAQS set at the levels of the current primary standards would meaningfully impact nitrogen and sulfur deposition-related acidification.¹⁰ As discussed in the proposal, EPA believes that chronic, long-term acidification is the most significant acidification-related ecological impact. *See, e.g., id.* at 46092, 46125. Indeed, EPA's scientific and technical assessment focused on long-term acidification and, as noted in the proposal, "concludes that an annual averaging time based on the average of each year over a consecutive 3- to 5-year period is appropriate to consider for the ambient air indicators NO_y and SO_x." *Id.* at 46126; *see also id.* at 46106 ("The current SO₂ secondary standard (0.5 ppm SO₂ over a 3-hour average) does not utilize an exposure period that is relevant for ecosystem impacts. The majority of deposition related impacts are associated with depositional loads that occur over periods of months to years. This differs significantly from exposures associated with hourly concentrations of SO₂ as measured by the current secondary standard.").

¹⁰ For the reasons explained above in section III of these comments, EPA is prohibited from issuing secondary NAAQS to address acidification. Accordingly, the basis for this proposed revision to the NAAQS is invalid and renders the proposal unlawful.

Not only are EPA's proposed revisions to the secondary NAAQS inconsistent with the EPA's assertions as to what form the NAAQS should take, the revisions are also wholly unsupported by EPA's technical and scientific analysis. EPA's ISA, REA, and PA only evaluate the development of a joint AAI-based NAAQS. UARG previously cautioned that, if EPA determined an AAI-based standard was not appropriate, it had failed to evaluate any alternatives and, absent additional research and analysis, would not be able to support a NAAQS revision. *See Comments of the Utility Air Regulatory Group on the Policy Assessment for the Review of the Secondary National Ambient Air Quality Standards for NO_x and SO_x -- First External Review Draft at 3 (May 13, 2010).*

EPA's scientific, technical, and policy assessments still tell the public nothing about what the proposed 1-hour secondary NAAQS for SO₂ and NO₂ might achieve with respect to reducing acidic deposition or any other adverse ecosystem effects. The proposed rule practically acknowledges as much, stating only that the proposed standards would "result in reductions in oxides of nitrogen and sulfur that will directionally benefit the environment by reducing NO_y and SO_x deposition to sensitive ecosystems." 76 Fed. Reg. at 46135. Even this tepid statement stretches what EPA can scientifically demonstrate. In fact, there is no evidence whatsoever that any benefit to the environment will occur, given the important role historical loading plays in ecosystem acidification. In short, EPA can only guess at what its proposed revisions might achieve because it has failed to conduct a technical analysis necessary to support them.

The CAA does not allow EPA to select a NAAQS casually and arbitrarily simply because it determined (correctly, as discussed below) that the standard it had scientifically evaluated was untenable. The Act requires a secondary NAAQS revision to be based on the "latest scientific knowledge" supporting the selection of a level of protection that is neither higher nor lower than

necessary to protect the public welfare. CAA § 108(a)(2); *Whitman*, 531 U.S. at 475-76. EPA's proposed standards do not live up to these requirements.

As noted in the proposal, in April 1988, EPA proposed not to revise the existing secondary NAAQS for SO₂ because scientific uncertainties precluded the development of “an appropriate set of control measures.” 76 Fed. Reg. at 46087. EPA's proposed rule states that the Agency is once again unable to establish an “ecologically relevant” NAAQS due to scientific uncertainty, and acknowledges that the 1-hour standards it is proposing are not ecologically relevant. *Id.* at 46135. EPA should follow its own precedent and abide by the stringent requirements the CAA establishes for revising a NAAQS by simply refraining from altering the secondary NO_x and SO_x standards at this time.

V. The Proposed Rule Fails To Consider Properly Adversity to Public Welfare.

The proposed rule's discussion of adversity to public welfare is woefully inadequate, and, indeed, demonstrates only that the Administrator thinks the effects assessed by the Agency *might* be adverse. *See id.* at 46111 (the effects of NO_x and SO_x deposition “*could* be considered adverse”) (emphasis added); 46128 (impacts “*may* be adverse to public welfare”) (emphasis added). In describing how the concept of adversity to public welfare should be considered, the proposed rule states

Although there is no specific definition of adversity to public welfare, the paradigm of linking adversity to public welfare to disruptions in ecosystem structure and function has been used broadly by EPA to categorize effects of pollutants from the cellular to the ecosystem level. An evaluation of adversity to public welfare might consider the likelihood, type, magnitude, and spatial scale of the effect as well as the potential for recovery and any uncertainties relating to these considerations.

Id. at 46103.

The analysis that follows, however, can hardly be called a convincing application of this generally stated approach. The proposal notes a smattering of economic valuation studies that have examined the worth of such ecosystem-related values and activities as fishing, cultural activities, such as hiking and viewing fall leaves, existence value, motor boating, off-road driving, ecosystem services, and the value of forest products. These studies all have one thing in common: there is little or no evidence linking any of the values examined or their purported degradation to acidifying deposition. *Id.* at 46104 (“There is little evidence that acidification of freshwaters in the northeastern U.S. has significantly degraded these specific services”), (“it is difficult to quantify these services and how they are affected by acidification”); 46105 (“the data do not exist to directly link acidification damages to economic values of lost recreational ecosystem services in forests”), (“The EPA is not able to quantify at this time the specific effects on these values of acid deposition, or of any specific reductions in deposition, relative to the effects of many other factors that may affect them”). If EPA cannot quantify or even tie various effects to acidifying deposition, then it cannot rely on this information to support a conclusion that NO_x- and SO_x-related acidification causes adverse effects to the public welfare.

Nor does the proposed rule include an analysis of the magnitude or spatial extent of the purported effects of NO_x and SO_x deposition as part of an adversity to public welfare analysis. The proposed rule acknowledges that acidification is a regional and localized phenomenon. *See, e.g., id.* at 46108 (“Parts of the West are naturally less sensitive to acidification and subjected to lower deposition (particularly SO_x) levels relative to the eastern United States”). Indeed, EPA’s AAI-based NAAQS is premised on that very notion.

Instead of fully evaluating these issues, the proposed rule appears to assume that any possible effect, regardless of the level of evidence linking it to NO_x and SO_x deposition and

regardless of its value or limited geographic impact, is sufficient to be deemed an adverse effect to the public welfare. This is not a sufficient exercise of the Administrator's obligations under the CAA.

VI. The Proposed Rule Fails To Address the Beneficent Effects of NO_x and SO_x Deposition.

EPA is obligated to consider beneficent effects of NO_x and SO_x deposition as part of this review, and it has completely failed to do so. The U.S. Court of Appeals for the District of Columbia Circuit has expressly held that, when evaluating a NAAQS, EPA is to examine and base its decisions regarding the standard on the beneficent effects that might also be associated with the pollutant in addition to any adverse effects. Specifically, the Court concluded that the CAA requires EPA to consider both adverse and beneficent health effects of pollutants and to assess "net" impacts. *American Trucking Ass'n, Inc. v. EPA*, 175 F.3d 1027, 1053 (D.C. Cir. 1999), *modified on petition for reh'g en banc*, 195 F.3d 4, *rev'd in part sub nom. Whitman v. American Trucking Ass'n, Inc.*, 531 U.S. 457 (2001). Accordingly, EPA must give equal consideration to beneficent and adverse welfare effects in its assessment of what the science suggests may be an appropriate level for a NAAQS.

Instead, EPA simply avoids the issue. The proposed rule notes, for instance, "that the effects of nitrogen deposition in managed areas are viewed differently from a public welfare perspective than are the effects of nitrogen deposition in natural, unmanaged ecosystems, largely due to ... the potential for benefits of increased productivity in those ecosystems." 76 Fed. Reg. at 46089. Instead of evaluating those benefits, however, EPA has "chosen to focus on the effects of ambient oxides of nitrogen and sulfur on ecological impacts on sensitive aquatic ecosystems." *Id.* This is not consistent with the Act.

Similarly, as noted by CASAC, EPA has repeatedly ignored recommendations that the relationship between nitrogen enrichment, plant growth, and carbon sequestration be taken into account. Review of the *Policy Assessment for the Review of the Secondary National Ambient Air Quality Standard for NOx and SOx: Second Draft* at 10-11 (Dec. 9, 2010) (noting that the “tone and emphasis given [to the issue] has not been appropriately balanced”). The proposed rule does not attempt to assess these benefits either.

Because EPA’s proposed rule fails to discharge the Agency’s obligation to review beneficial effects of NOx and SOx deposition, it fails to satisfy the requirements of the CAA. EPA cannot issue a final rule until those effects have been considered and given appropriate weight.

VII. EPA’s AAI-Based Secondary NAAQS Concept Is Not a Viable Alternative to EPA’s Proposed Revision.

As described in the proposed rule, EPA believes that the science demonstrates that the current secondary NAAQS for NOx and SOx, which were designed to protect against foliar injury, are inadequate to protect the public welfare against nitrogen and sulfur deposition-related effects. 76 Fed. Reg. at 46110. Because of scientific limitations surrounding effects such as nutrient enrichment and mercury methylation, EPA focused its review of the secondary NAAQS for NOx and SOx on aquatic acidification. *Id.* As EPA has previously recognized, the nature of aquatic acidification, which is characterized by ecosystem to ecosystem variation, does not lend itself to regulation pursuant to the NAAQS program. 61 Fed. Reg. at 52855 (“Given the multiple causes and regional character of these problems, the Administrator also concludes that adoption of a nationally-uniform secondary standard would not be an effective approach to addressing them.”). Rather than seeking new legal authority from Congress, EPA has attempted to morph

the secondary NAAQS into a water quality-air quality hybrid standard so far removed from the standards envisioned in the CAA as to be hopelessly flawed.

As described above, the Agency had, until this review, maintained that secondary NAAQS were an improper vehicle for addressing NO_x- and SO_x-related acidification and that the features of the NAAQS program were fundamentally ill-suited to the problems posed by acidifying deposition. Specifically, significant regional variation in depositional loadings and ecosystem sensitivity to acidification were deemed insurmountable obstacles to establishing a national standard under the NAAQS program that would provide a reasonable and consistent level of welfare protection.

The fundamental incapacity of the NAAQS program to address acidification has not changed. Acidification remains an issue that affects different regions in different manners and continues to be insusceptible to reasonable regulation through a national limit on ambient NO_x and SO_x concentrations. EPA has attempted to paper over these problems by creating the AAI and characterizing it as consistent with past NAAQS. The agency asserts, for instance, that the AAI would be a “nationally applicable standard” and that it is “national in scope.” 76 Fed. Reg. at 46111. Similarly, the Administrator asserts that the AAI is “defined in terms of the same basic elements that are used to define any NAAQS—indicator, form, averaging time, and level.” *Id.*

Her further description, however, indicates that this is not entirely accurate:

The form would incorporate additional structural elements that reflect relevant multipollutant and multimedia attributes. These structural elements include the use of an ecological indicator, tied to the ecological effect we are focused on, and other elements that account for ecologically relevant factors other than ambient air concentrations. All of these elements would be needed to enable a linkage from ambient air indicators to the ecological indicator to define an ecologically relevant standard.

Id. All of these additional elements and the various complexities alluded to in the quotation above are intended to allow EPA to create a “national” air quality standard in name only. In reality, EPA’s AAI would be a water quality standard that allows regionally variable air quality. *Id.*

A nationally uniform, target ANC value is central to the operation of the AAI. It is this number that is then translated, via a model-based equation, into ranges of acceptable ambient concentrations of NO_x and SO_x, taking into account various ecosystem features that influence the effect of acidifying deposition on an ecosystem’s sensitivity and recovery potential. An AAI-based NAAQS is, therefore, a fundamentally new approach to regulating air quality under the NAAQS program. It is also inconsistent with the CAA.

As noted above, “[a]ny [secondary] *national* ambient air quality standard ... *shall specify a level of air quality* the attainment and maintenance of which in the judgment of the Administrator, based on such criteria, is *requisite to protect the public welfare* from any known or anticipated adverse effects associated with the presence of such air pollutant in the ambient air.” CAA § 109(b)(2) (emphasis added). Specifically, a NAAQS specifies a *single* level of air quality and this single level of air quality must be applied to the entire *nation*. An AAI-based standard is designed to achieve the exact opposite outcome. It specifies *a single nationally uniform water quality value* which is essentially the specification of *multiple allowable air quality levels*.¹¹

Other elements of the AAI-based NAAQS concept, as described in the proposed rule, further demonstrate that the standard would, in no sense relevant under the CAA, be national in

¹¹ Indeed, a joint NO_x and SO_x NAAQS based on the AAI would also allow variable levels of reductions in NO_x and SO_x, depending on the mix of NO_x and SO_x reductions selected for purposes of complying with the standard.

scope. Such a standard would, for instance, be applied differently in different ecoregions. Acid sensitive ecoregions would be subject to a standard applicable at the 70th or 90th percentile, and in relatively non-acid sensitive ecoregions, the standard would be applied at the 50th percentile. 76 Fed. Reg. at 46124. Thus, the standard would be more or less stringent depending on geography and the representativeness of the water bodies with data (see below). Even more glaring, the AAI-based NAAQS would entirely exclude certain parts of the country. As the proposed rule notes, there is a lack of data for Alaska, Hawaii, and the U.S. territories, rendering the Agency unable to design the values necessary to apply the AAI in those locations. *Id.* at 46123. EPA's solution to this problem is to "consider relying on the existing NO₂ and SO₂ secondary standards in these areas." *Id.* at 46124. A national standard cannot treat different parts of the country differently, and it certainly cannot exclude entire states and territories.

In sum, the AAI-based standard recommended by EPA staff would result in nationally-variable acceptable concentrations of NO_x and SO_x in the ambient air and would violate the CAA requirement that a NAAQS prescribe a single level of atmospheric concentrations of a criteria air pollutant. EPA is not free to rewrite the fundamental requirements of the CAA to address a problem in a manner that falls outside the bounds of its CAA authorities.

VIII. The AAI-Based Standard Described in EPA's Proposed Rule Suffers from Numerous, Critical Scientific and Technical Shortcomings, and the Agency's Proposed Field Pilot Program Is Insufficient To Address Them.

UARG has commented throughout this NAAQS review on the serious flaws in EPA's interpretation of the science related to aquatic acidification, EPA's basis for pursuing an AAI standard, the science related to the other welfare effects EPA has identified but not relied on in this review, and on the overwhelming scientific and technical problems with the AAI itself.

UARG hereby incorporates those comments by reference.¹² As discussed below, the scientific uncertainties associated with an AAI-based NAAQS are indeed enormous, -- even greater than EPA acknowledges in the proposed rule -- and they cannot be meaningfully reduced by the Pilot Program EPA proposes to undertake.

A. The Enormous Scientific Uncertainties Preclude EPA from Establishing an AAI-Based Standard.

EPA's rationale for refraining from proposing an AAI-based standard at this time is the considerable scientific uncertainty associated with the AAI. Indeed, the Agency explains that it cannot account for these uncertainties "by choosing either a more or less protective target ANC level and percentile of water bodies than would otherwise be chosen" because "the uncertainties are of such nature and magnitude that there is no reasoned way to choose such a specific nationwide target ANC level or percentile of water bodies that would appropriately account for the uncertainties, since *neither the direction nor the magnitude of change from the target level and percentile that would otherwise be chosen can reasonably be ascertained at this time.*" *Id.* at 46134-35 (emphasis added). In short, the level of uncertainty is so considerable that the Administrator has no meaningful way to assess what level of protection is requisite.

EPA further notes "specific elements within the structure of an AAI-based standard" that are, in her assessment, the sources of these uncertainties. *Id.* at 46130. These elements include

the deposition of SO_x, NO_y, and NH_x [reduced nitrogen] as well as the critical load-related component, each of which can vary within and across ecoregions. Overall system uncertainty relates not just to the uncertainty in each such element, but also to the combined uncertainties that result from linking these elements together within the AAI-based structure. Some of these elements—including, for example, dry deposition, pre-industrial base cation production, and reduced nitrogen deposition—are estimated with less confidence than other elements.

¹² See footnote 4, *supra*.

Id.

The proposed rule also identifies data gaps, such as “the lack of a full set of ambient air quality indicator measurements, notably including NO_y, throughout sensitive ecoregions across the U.S.” and water quality data, particularly in the West, as significant uncertainties. *Id.* at 46131. In addition, EPA acknowledges that the AAI relies on the CMAQ atmospheric model and steady state ecological models and that “application of these models for purposes of specifying the factors in the AAI equation, on an ecoregion scale, is a new application that introduces uncertainties, as noted below, especially in areas with limited observational data that can be used to evaluate this specific application.” *Id.* Further, the proposed rule indicates that the current AAI does not adequately screen out naturally acidic ecosystems, and that future research to “explicitly define natural acidity” should be undertaken as a part of future review. *Id.* at 46121. EPA further notes that CASAC expressed concerns over these uncertainties and suggested that future research be conducted to further assess and reduce them. *Id.* at 46133.

UARG agrees that these uncertainties and shortcomings are significant and pose insurmountable technical obstacles to establishing an AAI-based NAAQS at this time, assuming such a NAAQS is lawful. UARG has also pointed out additional flaws, weaknesses and uncertainties in EPA’s scientific basis for its AAI-based NAAQS.

- **EPA Has Failed To Conduct a Quantitative Uncertainty Analysis:** The CASAC NO_x and SO_x Secondary NAAQS Panel informed EPA that a quantitative uncertainty analysis is a critical component of the review of the NO_x and SO_x standard in its letter on the second draft of the PA. Review of the *Policy Assessment for the Review of the Secondary National Ambient Air Quality Standard for NO_x and SO_x: Second Draft* at 3 (Dec. 9, 2010) (“The final *Policy Assessment* needs to provide a more detailed analysis of the uncertainties”); CASAC Comments on the *Policy Assessment for the Review of the Secondary National Ambient Air Quality Standards for Oxides of Nitrogen and Oxides of Sulfur (February 2011)* at 11 (May 17, 2011) (“Because of the limitations of the uncertainty analysis, it is difficult to see how this could be used to inform the choices for the standard.”). The Agency failed to undertake such an analysis before finalizing the PA

or before proposing this NAAQS revision. The uncertainty analysis the Agency did prepare was incomplete and did not fully or quantitatively assess uncertainties. Indeed, as noted in the proposed rule, CASAC commented on the Agency's uncertainty analysis, stating that it was "difficult to judge the adequacy of the uncertainty analysis performed by EPA because of lack of details on data inputs and the methodology used, and lack of clarity in presentation." *See* 76 Fed. Reg. at 46133. The Electric Power Research Institute ("EPRI") has conducted a quantitative uncertainty analysis. Its results demonstrate that EPA's approach to estimating critical loads and relating them to atmospheric concentrations of NO_x and SO_x is characterized by uncertainties so large that the Agency cannot reasonably define a requisite level for a secondary NAAQS.

- **EPA's Models Have Been Shown To Be Inadequate:** The Administrator's proposal notes that EPA must do more to validate the models relied upon to establish the AAI. Analysis performed by EPRI has already demonstrated that EPA should harbor profound doubts as to the ability of these models to successfully simulate relevant factors and conditions. Moreover, if EPA were to propose an AAI-based standard, such as the one described in this proposed rulemaking, it would be establishing a NAAQS based entirely on models, something the Agency has not previously done and should not allow. Absent measured data, EPA is unable to verify the performance of the models it is relying on, and the establishment of a complex and costly regulatory program in the absence of data to confirm that it is warranted or appropriately designed is entirely arbitrary.
- **Selection of ANC as an Ecological Indicator:** EPA maintains that ANC is the preferred ecological indicator for use in an AAI-based NAAQS, and asserts that this issue "presents probably the lowest level of uncertainty in the entire methodology." *Id.* at 46115 (quoting CASAC). EPRI, however, has demonstrated serious problems with the use of ANC and has shown that ANC values do not correlate well with the actual mechanisms by which harm to ecosystems can occur. EPRI, Comments to the U.S. Environmental Protection Agency on the Secondary NAAQS for SO_x and NO_x, EPA Docket ID. No. EPA-HQ-OAR-2007-1145-0090 at 29 (Nov. 26, 2010) (hereinafter "EPRI Comments"). The Agency must reevaluate its position based on the new information it has received.
- **Improper Regulation of NH_x Effects Through a NO_x and SO_x NAAQS:** The proposed rule notes that reduced forms of nitrogen contribute to acidification and acknowledges that the AAI accounts for those impacts. 76 Fed. Reg. at 46091, 46118. An AAI-based standard would, therefore, impose more stringent controls on ambient NO_x and SO_x to offset effects of reduced nitrogen. This is an improper and inequitable use of the NAAQS. Indeed, in certain parts of the country the relative role of NH_x in acidifying deposition is particularly pronounced. The AAI should be amended to exclude NH_x-related impacts from the reductions that would be required in ambient NO_x and SO_x concentrations.
- **EPA Ignores Relevant Scientific Studies:** EPA's proposed rule and underlying scientific assessments fully discuss scientific studies identifying species injury that may be correlated with low ANC values and relies on these studies to establish a potential range for a target ANC level. *Id.* at 46092-93. EPA has failed, however to evaluate those

studies, identified by EPRI, that have shown no negative impacts associated with low ANC or that have found negative effects at high ANC values.¹³

- **Various Critical Components of the AAI Remain Unexamined:** As explained above, the AAI is a complex equation that relates a selected ANC to a range of ambient NO_x and SO_x concentrations while taking into account various ecosystem features that influence ecosystem response to acidic deposition. The number and precise functioning of these various ecosystem features is a highly complex issue in its own right. Some of these critical factors are not addressed in the AAI. It fails, for instance, to take into account base cation weathering, base cation exchange, and base cation deposition to name only a few. Similarly, the AAI assumes that deposition to concentration ratios are constant, which they are not. Further, the AAI's treatments of nitrogen uptake and sulfate retention are both flawed. Finally, EPA fails again to distinguish between acidic and acidified. An acidic water body does not mean it was acidified by the deposition of anthropogenic NO_x and SO_x. Without this distinction, determining historical acidity is problematic and one of the fundamental reasons the critical load concept is flawed.
- **Unclear Derivation of AAI Elements:** Although EPA has focused on developing the AAI throughout this review and despite the dedication of the vast majority of its proposed rule to describing the AAI and how it functions, it still remains entirely unclear how EPA would specify an AAI for a given waterbody. Geographic scope and representativeness of the waterbodies taken into consideration in assessing each state's degree of attainment, for instance, remain unclear.
- **Arbitrary Criteria for Identifying Sensitive Ecoregions:** EPA staff suggests a two-step process for determining an ecoregion's acid sensitivity status. For the first step, the Agency staff identifies those ecoregions with (1) greater than 5 percent of their waterbodies with data with ANC values less than 200 µeq/L, and (2) greater than 1 percent of their waterbodies with ANC values less than 100 µeq/L. *Id.* at 46120. In the second step, the staff sought to identify ecoregions "with significant managed areas that would not be considered as having a relatively pristine and rural character." *Id.* at 46120. The Agency identified those ecoregions with less than 20 percent developed and agricultural areas combined with forested area greater than 50 percent. *Id.* at 46121. This process led to the identification of 22 acid sensitive areas. *Id.* The selection criteria EPA applied in each of these steps have never been specified. Thus, there is no clear scientific basis or justification for the Agency's approach.

¹³ EPRI, Comments to CASAC on the Final Policy Assessment Document: EPA Review of the Secondary NAAQS for SO_x and NO_x at 48-49 (Feb. 15, 2011), available at [http://yosemite.epa.gov/sab/sabproduct.nsf/BA87EB194E22193585257838004C78BE/\\$File/Ela dio+3.pdf](http://yosemite.epa.gov/sab/sabproduct.nsf/BA87EB194E22193585257838004C78BE/$File/Ela dio+3.pdf) (hereinafter "EPRI Comments to CASAC"). The proposed rule also discusses negative impacts to Atlantic salmon in Adirondack lakes. 76 Fed. Reg. at 46095. It is not appropriate to base a potential NAAQS on impacts to nonnative species.

- **Arbitrary Selection of Percentage of Waterbodies To Protect:** The proposed rule “recognizes that there is no basis for independently evaluating the degree of protectiveness afforded by any specific percentile value” in assessing a percentage of waterbodies to protect in sensitive and less sensitive ecoregions. *Id.* at 46122. As a result, the 50th percentile for relatively non-sensitive ecoregions and a range of the 70th to 90th percentile for sensitive ecoregions suggested by Agency staff is entirely arbitrary.
- **Bias in the Available Data:** The proposed rule notes that the AAI-standard is based on a limited body of science developed from case studies in relatively few acid sensitive areas. *Id.* (noting that the nature of the data might warrant selecting a lower percentile as a result of overrepresentation of acid sensitive areas). EPRI has further demonstrated that the location of the water bodies with data in those areas EPA has assessed further skews the available scientific data and overrepresents the most sensitive waterbodies in the nation. EPRI Comments to CASAC at 18-23. This biases the stringency of any standard developed on the basis of that information.
- **Obfuscation When AAI Doesn’t Work:** EPA identifies four sensitive eco-regions in the Southeast United States that were found to be non-responsive to reductions in NOx and SOx deposition. Rather than acknowledging the deficiency in the AAI, EPA offers various explanations including the erroneous explanation of natural organic acidity (rather than the fact that the soils are highly weathered) but never says what it would do with these four eco-regions.
- **Failure To Address Critical Implementation Issues:** Throughout this NAAQS review, UARG has commented on the lack of information relevant to the implementation of an AAI-based standard. *See* footnote 2, *supra*. EPA’s proposed rule, for the first time acknowledges that these questions remain unresolved, but it continues to downplay their significance. The Administrator states that “[w]hile not a basis for this decision,” refraining from proposing and finalizing an AAI-based standard at this time will allow the Agency to further analyze the following issues: (1) “the appropriate monitoring network density and siting requirements to support a compliance system based on ecoregions;” (2) “the appropriate parameters for establishing nonattainment areas;” (3) preconstruction permitting demonstration requirements-related issues; (4) the “additional tools, information, and planning structures ... needed to assist states with SIP [state implementation plan] development;” and (5) issues related to transportation conformity requirements. *Id.* at 46138-39. UARG supports the Administrator’s proposed finding that developing answers to critical implementation questions is appropriate before the proposal of a related NAAQS revision, although UARG continues to believe that an AAI-based standard or a standard to address acidification is unlawful. Further, in developing answers to implementation questions, EPA must take account of the proper role of the states under the CAA. For instance, EPA has indicated that it would develop all of the F factors critical to the implementation of an AAI-based NAAQS. States, however, should be given the opportunity to weigh in on these issues, for instance, in demonstrating attainment with such a standard. Similarly, the state role in the designation process must be accommodated. EPA should ensure that these consideration are given adequate weight.

- **Unknown Effect of the Conceptual AAI-Based Standard:** Unlike in other NAAQS reviews, EPA has failed to analyze the impact of the AAI-based standard. Not only is it unclear what parts of the nation could be designated attainment and nonattainment based on EPA's analysis, it is similarly unknown what sort of emission reductions would be needed to bring nonattainment areas into attainment. It is also unknown whether the contemplated NAAQS would result in changes in waterbody ANC sufficient to avert any of the purported ecosystem harms EPA identifies. Nor is it clear what period of time would be required for such a change in conditions to occur as a result of decreases in deposition brought about by the NAAQS. Further, EPA has failed to examine the impacts on acid conditions and deposition that will result from existing regulatory programs and programs that are already scheduled to be put into place.

These various technical issues are of enormous importance. Individually, each one of these matters is the source of large uncertainties and requires evaluation before any AAI-based NAAQS could reasonably be determined to be appropriate, even if the Act permitted EPA to set a NAAQS based on acidification effects. And even if these core issues were understood, the lack of a nationwide, representative (of all water bodies) data base on key water quality variables, aquatic biota variables, soil chemistry variables, and watershed characteristics would preclude a proper assessment of the extent and magnitude of the problem. Taken as a whole, the lack of detail and certainty on these core issues supports the Agency's proposed conclusion that current science is inadequate to provide a basis for an AAI-based standard at this time.

B. EPA's Proposed Field Pilot Program Cannot Meaningfully Reduce the Uncertainties Associated with an AAI-Based Standard, Even If One Were Legal.

To address uncertainties and data gaps, EPA proposes to undertake a Field Pilot Program. Generally, EPA states that the goal of the program is "to enhance our understanding of the degree of protectiveness that would likely be afforded by a standard based on the AAI ... [and to] support development of an appropriate monitoring network." *Id.* at 46135.

The program would be conducted over the next five years and would involve a sample of three to five sensitive ecoregions. *Id.* EPA sets forth eight specific goals for this program:

- (1) Evaluate measurement methods for the ambient air indicators of NO_y and SO_x and consider designation of such methods as FRMs;
- (2) Examine the variability and improve characterization of concentration and deposition patterns of NO_y and SO_x, as well as reduced forms of nitrogen, within and across a number of sensitive ecoregions across the country;
- (3) Develop updated ecoregion-specific factors (i.e., F1 through F4) for the AAI equation based in part on new observed air quality data within the sample ecoregions as well as on updated nationwide air quality model results and expanded critical load data bases, and explore alternative approaches for developing such representative factors;
- (4) Calculate ecoregion-specific AAI values using observed NO_y and SO_x data and updated ecoregion-specific factors to examine the extent to which the sample ecoregions would meet a set of alternative AAI-based standards;
- (5) Develop air monitoring network design criteria for an AAI-based standard;
- (6) assess the use of total nitrate measurements as a potential alternative indicator for NO_y;
- (7) Support related longer-term research efforts, including enhancements to and evaluation of modeled dry deposition algorithms; and
- (8) Facilitate stakeholder engagement in addressing implementation issues associated with possible future adoption of an AAI-based standard.

Id. at 46136.

Goals 1, 5, 6, and 7 are directly related to the assessment of appropriate Federal Reference Methods and monitoring networks for use in the implementation of an AAI-based standard. UARG agrees that a NAAQS is inseparable from the ambient monitoring techniques that are used to judge compliance with it. Accordingly, these techniques must be specified at the time a new NAAQS is promulgated.

Similarly, UARG supports goal 8 of the program. UARG has emphasized the importance of addressing implementation concerns throughout this NAAQS review¹⁴ and believes that such issues cannot be addressed effectively after finalizing a standard, especially one so unlike all other existing NAAQS. The states must have a meaningful role in both “designation” of non-attainment areas as well as implementation. EPA’s approach in the AAI would usurp the states’ role in designations and needs to be reversed.

The remaining goals of the program are more problematic. Even if an AAI-based NAAQS were legal (which UARG believes it would not be for the reasons discussed in section III and V, above) EPA would need more than a “Pilot” study. EPA would need to look beyond only “sensitive” areas. And EPA would need to calculate the AAI for more than “sample ecoregions” to “examine the extent to which” they “would meet a set of alternative AAI-based standards.” *Id.* In EPA’s formulation, these remaining goals would provide the Agency with relatively limited data akin to what EPA has already collected. Indeed, these studies apparently will do little more than replicate the Adirondack and Shenandoah case studies on which EPA has relied during this review in possibly new, but similar case study areas. At the most basic level, EPA would need to evaluate areas that are more representative of the country, including areas it believes are relatively non-acid sensitive. EPA would need to develop a nationwide, representative (of all water bodies) data base on water quality variables, aquatic biota variables, soil chemistry variables, and watershed characteristics to allow a proper assessment of the extent and magnitude of the problem. Reviewing additional sensitive ecoregions would not be expected to provide the Agency with a meaningfully more comprehensive understanding of deposition-

¹⁴ See, e.g., Comments of the Utility Air Regulatory Group on the Policy Assessment for the Review of the Secondary National Ambient Air Quality Standards for NO_x and SO_x Second External Review Draft (September 2010) at 29-31 (Nov. 26, 2010).

related acidification impacts than it already has and would continue to preclude it from performing a nationwide assessment.

More fundamentally, however, this program will not address the myriad uncertainties and gaps in knowledge. The Agency would need to, for instance, reevaluate its reliance on ecoregions and its methodology for classifying sensitive and relatively non-sensitive areas to determine if its approach is factually sound. EPA's proposed Field Pilot Program would also do nothing to rectify the Agency's failure to perform a complete quantifiable uncertainty analysis, nor would it address the serious shortcomings identified by CASAC and EPRI with respect to the limited analysis it did perform.

By EPA's own admission, "a source of uncertainty in an AAI-based secondary standard that would not be directly addressed in the pilot program stems from the uncertainty in the model used to link atmospheric concentrations to dry deposition fluxes." *Id.* at 46138. Not only would this source of uncertainty go unaddressed, so would all of the uncertainties associated with EPA's use of modeling. EPA could not support an AAI-based NAAQS -- to the extent one would be lawful at all -- without evaluating the performance of its aquatic models, e.g., its reliance on steady state models and the assumptions that underlie EPA's application of those models, and the performance of all major aspects of its atmospheric models. Similarly, EPA could not support an AAI-based NAAQS without being able to distinguish between acidic and acidified water bodies, with or without models.

Finally, it is difficult to see how a five-year pilot study, such as the one envisioned in the proposed rule, could be expected to inform the next review of the secondary NAAQS. Indeed, EPA could complete such a program, at the earliest, just as its deadline for completing another NAAQS review arrives. EPA cannot undertake a review of the science, which necessarily

precedes completion of a review proceeding by some time, while its research program is only just getting underway. In sum, the proposed Field Pilot Program will not provide EPA with the kind of information that would be necessary to support the adoption of an AAI-based standard, even if one were consistent with the CAA.

IX. Conclusion

EPA's proposed revision of the secondary NAAQS for NO_x and SO_x is flawed in several fundamental respects. The Agency has provided no scientific or technical support for the revision it is proposing and as such, it is invalid. Moreover, the proposed revision of the NO_x and SO_x secondary NAAQS is premised on deposition-related effects on aquatic acidification, a basis that is inconsistent with Title IV of the CAA.

Furthermore, although EPA has appropriately refrained from proposing an AAI-based NAAQS at this time, it is clear that EPA intends to continue to pursue the development of such a standard. Such a NAAQS would not only violate Title IV of the CAA, it would be fundamentally inconsistent with the CAA requirement that a NAAQS designate a nationally uniform level of minimally acceptable ambient air concentrations of a criteria air pollutant. Finally, even if an AAI-based NAAQS could be promulgated consistent with the law, the uncertainties associated with the standard EPA has developed remain enormous, and EPA's Field Pilot Program is incapable of adequately resolving those issues.

For these and all of the foregoing reasons, EPA's proposed rule is invalid. EPA should simply retain the existing secondary standards.

Attachment 2

**COMMENTS OF THE UTILITY AIR REGULATORY GROUP
ON THE
POLICY ASSESSMENT FOR THE REVIEW OF
THE SECONDARY NATIONAL AMBIENT AIR QUALITY
STANDARDS FOR NOX AND SOX**

**SECOND EXTERNAL REVIEW DRAFT
(SEPTEMBER 2010)**

DOCKET ID No. EPA-HQ-OAR-2007-1145

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**COMMENTS OF THE UTILITY AIR REGULATORY GROUP
ON THE POLICY ASSESSMENT FOR THE REVIEW OF
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SECOND EXTERNAL REVIEW DRAFT
(SEPTEMBER 2010)**

DOCKET ID No. EPA-HQ-OAR-2007-1145

NOVEMBER 26, 2010

Executive Summary

U.S. Environmental Protection Agency (“EPA” or “Agency”) staff has proposed to use a joint secondary National Ambient Air Quality Standard (“NAAQS”) for oxides of nitrogen (“NO_x”) and sulfur oxides (“SO_x”) to address deposition-related aquatic acidification. This undertaking has been flawed from its inception, and the analysis the Agency staff has performed during this review only proves how misguided this plan is. The concept -- which remains too poorly developed to merit serious consideration as a workable regulatory proposal at this stage -- for addressing aquatic acidification through the secondary NAAQS should be abandoned because it is inconsistent with both the Agency’s legal obligations and sound public policy.

That a secondary NAAQS is the incorrect tool for addressing acidification related to NO_x and SO_x deposition is evident. Indeed, every relevant factor, from the structure of the Clean Air Act (“CAA” or “Act”) to the nature of ecosystem acidification, underscores how ill-suited the NAAQS program is to addressing aquatic acidification.

First, although the secondary NAAQS were designed to protect the public welfare against a generally broad array of adverse ecosystem impacts, Congress crafted the CAA Title IV Acid Rain Program with the specific purpose of controlling NO_x- and SO_x-related acidification. Congress took this action because it determined, along with EPA, that the secondary NAAQS did not provide a workable solution to the issue of airborne NO_x- and SO_x-based acidification.

Further, Congress never intended for EPA to revise unilaterally the acidification controls that Congress devised. On the contrary, the Congress reserved, through binding legislation, the right to revisit the issue of NO_x and SO_x acidification regulation. EPA action to impose an acidification-based NAAQS usurps the legislature's role in contravention of clearly expressed congressional intent.

The Agency and EPA staff ignore these limitations and have instead focused their analysis during this review on a misguided effort to reconfigure the NAAQS program in a manner that, they assert, overcomes the barriers to acidification regulation under the program. Yet, the nature of our understanding of NO_x- and SO_x-related acidification has not changed in any fundamental way so as to render the NAAQS program better-suited to address this effect and neither have the controlling laws been amended. Thus, the Agency's efforts in this regard amount to nothing more than an elaborate smokescreen intended to obfuscate the fact that the regulatory approach under consideration violates every basic, statutorily prescribed requirement applicable to the standards.

The CAA establishes as a first principle that the secondary standards are to specify a single, nationwide, minimally acceptable ambient concentration for each listed criteria air pollutant. EPA staff's recommended approach to regulating the acidification effects of NO_x and SO_x would do none of these things. It would substitute an elaborate, ill-defined equation -- the Atmospheric Acidification Potential Index, or AAPI -- for a traditional standard, and in doing so would establish nationally-variable acceptable concentrations of NO_x and SO_x that would be specified in terms of a controlling level of aquatic acid neutralizing capacity ("ANC"), a measure of aquatic ecosystem health. This is nothing like any previously adopted NAAQS, and for good reason. It bears no resemblance to what is allowable under the Act.

Despite all of this, EPA staff asserts in the Policy Assessment Document that an AAPI standard is consistent with the Act and is simply a standard that is more technically complicated than its predecessors. To suggest the AAPI NAAQS is complex is to understate the matter considerably. The equation itself incorporates many poorly defined factors that the Agency has not even begun to explain adequately. Further, the inputs for the equation are in some cases derived from modeling techniques that have never been appropriately verified. Compounding these problems, the Agency has declined to conduct any sort of quantifiable uncertainty analysis, leaving the performance of its contemplated regulatory approach nothing more than an unresolved question.

Similarly -- and, again, in contrast to past EPA practice -- the Agency's analysis has omitted any examination of key issues related to what an AAPI NAAQS would actually mean for the nation. There is no assessment of likely attainment and nonattainment areas under possible revised standards; there is not even any indication of what compliance areas might look like or how designations would be made. Further, the Agency staff acknowledges that monitoring issues -- including designation of Federal Reference Methods and Federal Equivalence Methods -- pose considerable hurdles, yet there is hardly any acknowledgement that the massive undertaking required to redress these shortcomings has barely even begun. As if to underscore that the policy and technical analysis presented thus far is simply inadequate, the Agency's independent science advisors consulting on the review of the NO_x and SO_x secondary standards have provisionally determined that they cannot fulfill their obligation to provide advice to the Administrator on the possible parameters of a revised standard.

The rudimentary nature of the Agency's review of a possible AAPI NAAQS shows not only that the technical issues posed by such a standard are complex and require substantially

more consideration, it belies the assertion that the AAPI is a permissible standard. Indeed, if the AAPI standard were permissible under the Act, would it not be expected that this review would bear a stronger resemblance to the reviews of the standards for other criteria pollutants? The Agency's departure from its past practices indicates the opposite is the case: that the AAPI standard is an attempt to craft a new form of regulation -- one with its fundamental features still a mystery -- and to simply label it a NAAQS. This is as unwise as it is impermissible.

Finally, the legality and propriety of any secondary NAAQS depends on whether the policy goals and the protections it aims to achieve are consistent with the first order purposes of the secondary NAAQS program. The CAA establishes that the secondary standards are to protect the "public welfare" from known or anticipated "adverse" effects. Thus, a pollutant's effect must be deemed both "adverse" and a threat of such a kind or extent that it rises to a level that is significant to the "public." The second draft Policy Assessment Document prepared during this review hardly scratches the surface of these overarching considerations. Indeed, the document's discussion of possible measures of adversity to public welfare does not even attempt to tie public valuation of welfare interests to NO_x and SO_x acidification impacts. If these matters are not seriously taken into account, there can be no assurance that any standard developed during this NAAQS review is appropriate or lawful.

All that is evident from EPA staff's assessment of the "available" options for revising the secondary NAAQS for NO_x and SO_x is that the Agency has plotted a path into untrodden territory despite every indication that its goal -- regulation of acidification -- and its preferred regulatory approach -- the AAPI -- are impermissible as a matter of law. Everything the Agency has presented during this NAAQS review -- along with the scope of the issues it has yet to examine -- suggests that the Agency must abandon the regulatory approach it has thus far

pursued and revisit its underlying assumptions regarding what the law allows under the secondary NAAQS program.

I. Introduction

On September 21, 2010, the United States Environmental Protection Agency (“EPA” or “Agency”) published notice in the Federal Register indicating that the Second External Review Draft of the *Policy Assessment for the Review of the Secondary National Ambient Air Quality Standards for Oxides of Nitrogen and Oxides of Sulfur* (“PA”) had been released for public review “on or about September 13, 2010.” 75 Fed. Reg. 57463. The original deadline for the submission of public comments on the document was November 12, 2010. Because the Agency subsequently released additional materials related to the contents of the PA, the Agency granted a request for an extension of the public comment period, moving its close to November 26, 2010. 75 Fed. Reg. 70258 (Nov. 17, 2010).

The Utility Air Regulatory Group (“UARG”)¹ is pleased to offer the following comments on the second draft PA for the review of the secondary NAAQS for NO_x and SO_x. UARG has submitted comments during each phase of this NAAQS review and has, in general, questioned the propriety and lawfulness of the policies EPA has developed for a potential revision to the secondary NO_x and SO_x standards.² This draft of the PA perpetuates the many serious flaws

¹ UARG is a voluntary, nonprofit group of individual electric generating companies and industry trade associations. UARG’s purpose is to participate on behalf of its members collectively in EPA’s rulemaking and other Clean Air Act proceedings that affect the interests of electric generators, and in related litigation. Since 1977, UARG has participated in virtually all key rulemakings, related litigation, and other arenas of policy development under the Clean Air Act that affect electric generating companies.

² Comments of the Utility Air Regulatory Group on the Policy Assessment for the Review of the Secondary National Ambient Air Quality Standards for NO_x and SO_x: First External Review Draft, Docket ID No. EPA-HQ-OAR-2007-1145-0070.1; Comments of the Utility Regulatory Group on the Second Draft of the Risk and Exposure Assessment for Review of the Secondary National Ambient Air Quality Standards for Oxides of Nitrogen and Oxides of Sulfur, Docket ID No. EPA-HQ-OAR-2007-1145-0061.1; Comments of the Utility Air Regulatory Group on the Risk and Exposure Assessment for Review of the Secondary National Ambient Air Quality Standards for Oxides of Nitrogen and Oxides of Sulfur -- Environmental

UARG has previously identified, and EPA has failed to respond to many of the points UARG has raised. Moreover, the document, by any reasonable measure, remains little more than a preliminary foray into the many critical legal, policy, and technical issues that the Agency will have to resolve before proposing a revision to the secondary NO_x and SO_x standards. The PA adopts a novel, and in many respects, legally dubious, approach to setting a NAAQS; yet the depth of analysis presented raises more questions than it answers. EPA is simply not adequately prepared to move forward with the revision contemplated in this document. UARG therefore urges the Agency staff and the EPA Administrator to reconsider this rush to codify an ill-prepared, and in our view invalid, secondary NAAQS for NO_x and SO_x.

II. Legal Standards and Process Governing the Review of the Secondary NAAQS for NO_x and SO_x.

Sections 108 and 109 of the Act require the promulgation and periodic review of the NAAQS and provide the basic framework for these processes. Under § 108(a)(2), the NAAQS establishment process begins when the Administrator lists a pollutant as a “criteria air pollutant.” Listing is appropriate when: (1) the Administrator determines that emissions of the pollutant “cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare,” (2) she determines that the presence of these emissions in the ambient air “results from numerous or diverse mobile or stationary sources,” and (3) she intends to prepare air quality criteria for the pollutant. CAA § 108(a)(1).

Criteria (First External Review Draft), Docket ID No. EPA-HQ-OAR-2007-1145-0051.1; Comments of the Utility Air Regulatory Group on the Integrated Science Assessment for Oxides of Nitrogen and Sulfur -- Environmental Criteria (Second External Review Draft), Docket ID No. EPA-HQ-OAR-2007-1145-0050.1; Comments of the Utility Air Regulatory Group on the Integrated Science Assessment for Oxides of Nitrogen and Sulfur -- Environmental Criteria (First External Review Draft) and on the Draft Scope and Methods Plan for Risk/Exposure Assessment: Secondary NAAQS Review for Oxides of Nitrogen and Oxides of Sulfur, Docket ID No. EPA-HQ-OAR-2007-1145-0025.1.

The Act directs the Administrator to prepare “air quality criteria” for each listed pollutant. Air quality criteria are required by law to “accurately reflect the latest scientific knowledge useful in indicating the kind and extent of all identifiable effects on public health or welfare which may be expected from the presence of such pollutant in the ambient air, in varying quantities.” *Id.* § 108(a)(2). The information contained in these criteria thus serves as EPA’s scientific basis for setting (1) a “primary” NAAQS at the level that, in the Administrator’s judgment, is requisite to protect the public health with an adequate margin of safety, *id.* § 109(b)(1), and (2) a “secondary” NAAQS at the level that, in the Administrator’s judgment, is requisite to protect the “public welfare” from known or anticipated adverse effects, *id.* § 109(b)(2).

The Act further requires the Administrator to review the “air quality criteria” and the NAAQS not less frequently than every five years and to “make such revisions in such criteria and standards and promulgate such new standards as may be appropriate in accordance with [CAA § 108 and CAA § 109(b)].” *Id.* § 109(d)(1). Revisions to the NAAQS are appropriate only if the NAAQS are no longer at the level requisite to protect public health or welfare, *i.e.*, they are either higher or lower than necessary to provide the required level of protection. *See Whitman v. Am. Trucking Ass’ns*, 531 U.S. 457, 475-76 (2001).

NO_x and SO_x have both been the subject of primary and secondary NAAQS since 1971, and, of relevance here, the individual secondary standards for each pollutant have undergone review pursuant to CAA §§ 108 and 109.³ The current review, however, differs from previous proceedings in two significant ways.

³ EPA last completed a review of the secondary NAAQS for NO_x in 1996. 61 Fed. Reg. 52,852 (Oct. 8, 1996). EPA’s current secondary NAAQS for NO_x (using the indicator nitrogen dioxide (“NO₂”)) is an annual arithmetic mean standard of 0.053 ppm. 40 C.F.R. § 50.11 (2009).

First, this joint review of the NO_x and SO_x secondary NAAQS is a departure from past EPA NAAQS-related practice. As stated in the PA, “EPA has historically adopted separate secondary standards for oxides of nitrogen (NO_x) and oxides of sulfur (SO_x).” PA at 1-8. In this review, however, “EPA is conducting a joint secondary review of these standards because NO_x, SO_x, and their associated transformation products are linked from an atmospheric chemistry perspective, as well as from an environmental effects perspective.” *Id.* The joint review of the secondary NAAQS for NO_x and SO_x has, moreover, led the Agency staff to recommend adoption of a single secondary standard applicable to both pollutants, an additional departure from past practice under the NAAQS program.

This review is also being conducted pursuant to a revised process that builds upon the basic NAAQS review requirements as stated in §§ 108 and 109. The revised process, based on guidance from the Administrator, recasts the “air quality criteria” as an Integrated Science Assessment (“ISA”), which contains a “concise evaluation, integration and synthesis of the most policy-relevant science,” and is “supported by a more detailed and comprehensive science assessment support document.”⁴ In addition, EPA staff prepares a risk/exposure analysis (“REA”) that focuses on “key results, observations, and uncertainties” and that “ensure[s] the characterization of risk and exposure are informed by the clearest possible understanding of the

The last review of the secondary NAAQS for SO_x was completed in 1993. 58 Fed. Reg. 21,351 (Apr. 21, 1993). The current secondary NAAQS for sulfur dioxide (“SO₂”), the indicator for SO_x, is a 3-hour standard of 0.5 parts per million, not to be exceeded more than once per calendar year. 40 C.F.R. § 50.5(a) (2009).

⁴ Memorandum from Marcus Peacock, Deputy Administrator, to Dr. George Gray, Assistant Administrator, Office of Research and Development, & Bill Wehrum, Acting Assistant Administrator, Office of Air and Radiation 2 (Dec. 7, 2006) (Process for Reviewing National Ambient Air Quality Standards).

available scientific information.”⁵ Following this, and prior to the Administrator’s proposal of any regulatory changes to the existing NAAQS, EPA staff prepares a “policy assessment document,” which “integrates and interprets information from the ISA and the REA to frame policy options for consideration by the Administrator,” based on a “transparent staff analysis” of the scientific basis for those options.⁶ The review of the secondary NO_x and SO_x standards has progressed to this policy assessment phase, and the developing policy assessment document is the subject of these comments.

The PA’s purpose, according to guidance from the Administrator, is to synthesize the information contained in the NO_x and SO_x welfare-related ISA and REA with the various legal and policy considerations relevant under the CAA, and thereby translate the relevant technical and scientific information into a range of policy options for the Administrator’s consideration. As with the first draft of the document, this draft of the PA fails to meet this objective. It fails to assess the relevant legal issues implicated by the features of the standard EPA staff recommends; it fails to address the fundamental purposes of a secondary NAAQS and whether the recommended standard is consistent with those purposes; and it fails to evaluate adequately numerous critical issues that the Administrator will have to take in account when determining whether a revision to the NAAQS is warranted. It also fails to provide clear options for a revised standard, staff rationale for those options, or an assessment of the implications of those options for the attainment/nonattainment landscape across the nation. The absence of this critical material appears to be due to the fact that the staff is continuing to develop this novel, legally

⁵ *Id.*

⁶ Memorandum from Lisa P. Jackson to Elizabeth Craig, Acting Assistant Administrator for Air and Radiation, & Lek Kadeli, Acting Assistant Administrator for Research and Development (May 21, 2009) (hereinafter “Jackson Memo”).

questionable method and is struggling with problems in the underlying data bases used. Moving forward with a work in progress without adequate public review is inappropriate.

Indeed, the Panel of the EPA's Clean Air Scientific Advisory Committee ("CASAC") charged with reviewing the PA found itself unable to provide a recommendation on the elements of the standard and requested that the Agency provide a more complete draft for CASAC review. *See* Letter from CASAC to the Hon. Lisa P. Jackson, Administrator, EPA, 2-3 (draft Oct. 29, 2010) (available at [http://yosemite.epa.gov/sab/sabproduct.nsf/0/C7DADE29586A6D3B852577CB00674002/\\$File/29Oct2010_NOx-SOx_Sec_PA_report+&+Att+C.pdf](http://yosemite.epa.gov/sab/sabproduct.nsf/0/C7DADE29586A6D3B852577CB00674002/$File/29Oct2010_NOx-SOx_Sec_PA_report+&+Att+C.pdf)) (hereinafter "Draft Letter"). If the scientific and technical experts responsible for providing guidance to the Agency cannot recommend a standard based on the PA, it is difficult to imagine how the Administrator can be expected to reach such a conclusion. Because the current draft of the PA does not even approach the Administrator's standard for policy assessment documents, the PA is insufficient to assist the Administrator in determining whether and, if so, how to revise the secondary NAAQS for NO_x and SO_x.

An additional problem plagues the PA and renders it inadequate to a proper review of the secondary NO_x and SO_x standards. The document, and indeed, this entire review, is premised on a fundamental misunderstanding of the purposes behind the CAA's secondary NAAQS program. As stated in § 109(b)(2) of the Act, the secondary standards are to be "requisite to protect the *public* welfare from any known or anticipated *adverse* effects." (emphasis added). Whether an effect should be considered adverse and whether it rises to a level of public welfare significance are key issues that have not been fully examined by the Agency to date, and which figure only marginally in the analysis EPA staff presents in the PA.

The PA's chapter on adversity considerations, for instance, states that any "disruption in ecosystem services and function" could be considered adverse, and that "[a]n evaluation of adversity to public welfare might consider the likelihood, type, magnitude, and spatial scale of the effect as well as the potential for recovery and any uncertainties relating to these considerations." PA at 3-1. It goes on to recite what various other federal statutes define as ecosystem impacts of significance. PA at 3-4 to 3-9. In addition, the PA briefly recites the findings of a smattering of economic valuation studies that examine the worth of such ecosystem-related activities as fishing, PA at 3-26; various "cultural" activities, such as hiking and viewing fall leaves, PA at 3-27, 3-31 to 3-32; and the value of forest products and habitat for endangered species, PA at 3-31.

As EPA staff acknowledges, there is no data to "link acidification damages directly to" the various economic values discussed in the PA. *See, e.g.*, PA at 3-31. Accordingly, these values tell us nothing about whether the effects EPA staff attributes to NO_x- and SO_x-related acidification are adverse to public welfare. Similarly, the levels of ecosystem protection afforded under other laws tell us only what the standards controlling under those statutes require. They do little to inform the level of protection requisite under § 109(b)(2) of the CAA. Thus, the assessment of adversity to public welfare presented in the PA is entirely irrelevant to the review of the secondary NAAQS for NO_x and SO_x.

The document fails to assess the very things EPA staff state are relevant. The PA does nothing to review the "likelihood, type, magnitude, and spatial scale of the effect as well as the potential for recovery and any uncertainties" and relate such an assessment to the requirements of the Act. *See* PA at 3-1. The PA should evaluate these various factors and provide some guidance on how the Administrator is to determine if an effect is not only "adverse" to a welfare

interest but if it is actually important from a “public” standpoint. It should be obvious that not every impact will be adverse and that not every adverse impact is relevant to the public. Yet the PA does nothing to inform the Administrator’s necessary inquiry into what effects warrant remediation. The approach taken in the PA, while providing lip-service to the concepts of adversity and public welfare significance, effectively negates their importance because it finds that almost any effect warrants regulation under the Act, without any meaningful justification for that conclusion.

The Agency staff should instead examine the fundamental nature of the secondary NAAQS program and its purpose. It should attempt to develop a standard approach for determining whether adverse effects are significant from a public perspective and evaluate the NO_x- and SO_x-related effects it has identified to determine whether they are truly relevant for purposes of the CAA and the secondary NAAQS program. If this type of analysis is not conducted, there is no legitimate way for the Agency to conclude that it has examined the relevant factors and made a regulatory decision based upon them. A potential revision to the NAAQS in the absence of such information is neither sound policy nor lawful.

III. Procedural Concerns

EPA’s schedule for this review of the secondary NO_x and SO_x standards has been driven by a series of court ordered deadlines, including the requirement that EPA sign a notice of proposed rulemaking by July 12, 2011 and sign a final rule by March 20, 2012. *See Center for Biological Diversity v. Johnson*, Consent Decree (Nov. 19, 2007); Second Stipulation to Amend Consent Decree (Oct. 22, 2009). It is now apparent that this schedule is overly ambitious. The Agency is rushing towards the NAAQS revision now under consideration despite the lack of any sound technical (or legal) justification for it. A court ordered deadline, while important, is not a

sufficient basis for failing to comply with the rigorous scientific and technical requirements that the CAA imposes on the Agency.

The inadequacy of the Agency's work as a basis for the new secondary NAAQS contemplated by the PA is confirmed by the conclusions of the CASAC Panel charged with reviewing the document. In its draft letter prepared on behalf of the full CASAC for submission to the EPA Administrator, the Panel makes the following critical observations:

The Panel's review of this document has been challenging as a result of several factors. Even though the second draft Policy Assessment was novel and complex, the Panel received the document only three weeks before the review meeting. As delineated further in Attachment A and in our responses to the Charge Questions, there are critical sections of the Policy Assessment that are unclear and/or where further analyses are necessary. In addition, and in contrast to Policy Assessments for other pollutant reviews, EPA did not provide staff recommendations for key elements of the secondary NAAQS for NO_x and SO_x along with supporting rationales. As a result, the Panel was not able to provide specific comments on the EPA Staff recommendation nor was the Panel was not [*sic*] able to use Staff recommendations to help frame CASAC recommendations about the four key elements of the NAAQS.

Draft Letter at 2.

These various shortcomings are significant. Indeed, as a result of them the Panel was hampered in advising the Agency:

As a result of the issues identified above, the Panel is not prepared to provide a consensus recommendation on elements of the standard. The document requires further revision to adequately inform us, or you, on the specifics of a revised (and in this case novel) NO_x-SO_x NAAQS.

Id.

Further, the revisions the Panel deemed necessary were of such significance that it requested the Agency to alter its planned review schedule and provide an additional draft of the PA for further review:

The Panel recognizes the very tight time lines associated with revising the NO_x and SO_x secondary NAAQS, but the Panel views that CASAC should have the opportunity to review a more complete draft of the Policy Assessment --one that provides staff recommendations, the rationales for the choices made, the direct supporting analyses for those choices, and the ramifications of alternative choices within the ranges of the alternatives. Without this information we cannot provide you the level of advice traditionally provided by CASAC, nor is it apparent how you can make a well informed decision.

Id. at 2-3.

As the Panel noted in this Draft Letter, the Agency's rush to move forward with this radical new concept for a NAAQS has resulted in significant constraints on independent review of the Agency's work. These constraints have also applied to the public in addition to the CASAC Panel. Indeed, it is clear that outside technical review of EPA's calculations has been considerably hampered by the general unavailability of key data sets and the subsequent discovery of critical errors when those data sets have been released.

Clearly, these timing issues have adversely impacted the adequacy and completeness of the Agency's analysis in support of this review. Such a rushed process could result in an appropriate NAAQS revision only by fortunate coincidence. The unfinished state of the PA and the analysis it presents, as described in more detail below, means that the Agency cannot proceed to proposal without considerable additional work. EPA staff should reassess their available resources and if necessary, request an additional extension of the deadlines for further Agency action.

IV. A Secondary NAAQS To Address Acidification Is Inconsistent with Title IV of the CAA.

The PA is focused almost exclusively on the evaluation of factors relevant to setting a secondary NAAQS for NO_x and SO_x to protect against aquatic acidification resulting in part from deposition of airborne nitrogen and sulfur. Indeed, the PA states:

As a result of our assessment of the science, and reflecting the comments of the CASAC, this policy assessment is focused on developing a standard specifically designed to protect against the effects of aquatic acidification in sensitive ecosystems, while recognizing that such a standard may also provide co-protection against effects of terrestrial acidification, eutrophication of high elevation western lakes and terrestrial nutrient enrichment.

PA at 5-2.

In focusing on regulation of NO_x and SO_x emissions as a means to ameliorate any adverse ecosystem effects resulting from acidification, the Agency is disregarding that the CAA addresses acidification through provisions outside of the NAAQS program and, furthermore, that the statute precludes an acidification-based air quality standard. Indeed, the various congressional actions precluding establishment of an acidification-based NAAQS have previously been recognized by the Agency as foreclosing the availability of a standard such as the one Agency staff now recommends.

Congress has taken a number of significant steps related to acidification caused by NO_x and SO_x deposition. In 1980 -- well after the inception of the NAAQS program -- Congress enacted the Acid Precipitation Act of 1980, which created the National Acid Precipitation Assessment Program ("NAPAP"). 42 U.S.C. §§ 8901-8912. At that time, scientific understanding of the role of NO_x and SO_x in contributing to acidification and the effects of that acidification were in only the most nascent of stages. The NAPAP program was designed, therefore, to identify the causes and sources of acid rain; to evaluate its environmental, social,

and economic effects; and to assess potential methods of control. 42 U.S.C. § 8903. As enacted, the program operated for ten years and produced a number of reports, including a final report in 1990. *See* PA at 1-14. Subsequently, Congress extended the program. *See* CAA § 103(j).

Based, in part, on the findings generated by the NAPAP program, Congress took further action to address NO_x- and SO_x-related acidification. It enacted Title IV of the Clean Air Act Amendments of 1990 (“1990 Act”), which established the Acid Rain Program. Pub. L. No. 101-549, 104 Stat. 2399, 2584-2634 (Nov. 15, 1990); CAA §§ 401-416. Title IV requires substantial reductions of SO₂ and NO_x, achieved, in the case of SO₂, through a market-based allowance trading program and, in the case of NO_x, through defined emission rate limits imposed on regulated facilities. CAA §§ 403-406 (SO₂ program); CAA § 407 (NO_x program).

The existence of a regulatory program crafted by Congress to address directly NO_x- and SO_x-related acidification is properly viewed as supplanting any general authority found elsewhere in the CAA that could be interpreted to authorize additional regulation. This principle -- that the specific terms of a statute override the general terms -- is so well-established that it is counted among the most basic canons of statutory construction. Indeed, the U.S. Supreme Court has stated “[h]owever inclusive may be the general language of a statute, it will not be held to apply to a matter specifically dealt with in another part of the same enactment.” *Fourco Glass Co. v. Transmirra Products Corp.*, 353 U.S. 222, 228 (1957) (citations omitted); *see also United States v. Estate of Romani*, 523 U.S. 517, 532 (1998) (later, more specific statute governs); *FDA v. Brown & Williamson Tobacco Corp.*, 529 U.S. 120, 160 (2000) (holding that the FDA could not regulate tobacco under its general authority because Congress had enacted subsequent tobacco-specific legislation that did not permit a ban of the product).

EPA's interpretation of its authority under the NAAQS program flouts this fundamental principle of statutory interpretation. In the PA, the Agency staff seeks authority for its plan by noting that the 1990 Act, while adding the Acid Rain Program to address NO_x- and SO_x-related acidification specifically, also authorized an acidification-based NAAQS through an amendment to the definition of "welfare" as it relates to the secondary NAAQS program. The PA notes, "the definition of 'effects on welfare' in Section 302(h) was expanded to state that the welfare effects include effects '...whether caused by transformation, conversion, or combination with other pollutants.'" PA at 1-15. To interpret this very general language, which on its face could apply to a wide variety of situations involving secondary pollutants or combinations of pollutants, as an authorization to supplant the highly specific Acid Rain Program is simply unreasonable. The Agency has misinterpreted the CAA and, as a result, is proceeding down a road to a NAAQS that would be unlawful.⁷

The Agency's error in considering a secondary NAAQS for NO_x and SO_x based on acidification effects is even more apparent when viewed in light of another crucial provision of the 1990 Act, § 404. Section 404 required EPA to report to Congress on the feasibility of developing an acid deposition standard and the actions that would be required to integrate such a program into the CAA. 104 Stat. at 2632; CAA § 401 note (citations hereinafter to 1990 Act § 404). Specifically, § 404 states:

[T]he Administrator of the Environmental Protection Agency shall transmit to the Committee on Environment and Public Works of the Senate and the Committee on Energy and Commerce of the House of Representatives a report on the feasibility and effectiveness of an acid deposition standard or standards to protect sensitive and critically sensitive aquatic and terrestrial resources.

⁷ As discussed below, this misreading is also inconsistent with the Agency's prior interpretation of the law.

The study required by this section shall include, but not be limited to, consideration of the following matters:

- (1) identification of the sensitive and critically sensitive aquatic and terrestrial resources in the United States and Canada which may be affected by the deposition of acidic compounds;
- (2) description of the nature and numerical value of a deposition standard or standards that would be sufficient to protect such resources;
- (3) description of the use of such standard or standards in other Nations or by any of the several States in acid deposition control programs;
- (4) description of the measures that would need to be taken to integrate such standard or standards with the control program required by title IV of the Clean Air Act;
- (5) description of the state of knowledge with respect to source-receptor relationships necessary to develop a control program on such standard or standards and the additional research that is ongoing or would be needed to make such a control program feasible; and
- (6) description of the impediments to implementation of such control program and the cost-effectiveness of deposition standards compared to other control strategies including ambient air quality standards, new source performance standards and the requirements of title IV of the Clean Air Act.

1990 Act § 404.

A close reading of § 404 demonstrates that Congress did not intend EPA to establish regulatory programs to redress acidification related to NO_x and SO_x deposition through any of the Agency's authorities other than the Title IV program specifically designed for such purposes. First, § 404 indicates that Congress wanted information on whether an acid deposition standard was feasible in order to assess whether Congress should create such a program. Second, Congress requested specific information about the appropriate levels and form for additional acidification-based regulation, information that would have been critical to the legislature only if

the Congress contemplated debating the merit of enacting a statute to authorize such a program. Third, Congress requested information about the design of non-federal acid deposition programs and information related to how such new regulation could be integrated with the CAA. This can only be understood as an indication that Congress believed an amendment to the CAA would be necessary before additional acidification-based regulatory action would be authorized. Finally, § 404 directs EPA to describe the impediments and costs of an additional acidification program and to compare such hurdles to those faced under the NAAQS program. The only reasonable conclusion is that Congress enacted this language into law based on the premise that the NAAQS program was not available for purposes of regulating acidification. And where Congress premises an amendment enacted into law on an interpretation of an existing statute, that interpretation is controlling. *See, e.g., Merrill Lynch, Pierce, Fenner & Smith v. Curran*, 456 U.S. 353, 382-87 (1982).

The legislative history of the 1990 Act confirms that Congress intended the Acid Rain Program to be the only source of authority for regulation of acidification. H. Rep. No. 101-490 at 157 (1990) states that “[t]he Clean Air Act was originally designed mainly to reduce high pollution levels that tend to occur near major pollution sources. It did not contemplate that long-distance transport of air pollutants could cause widespread adverse impacts.” This report further indicates that as a result of Congress’ concern over the problems posed by acidic deposition, and due to the fact that the CAA was not designed to address it, the 1990 Act “includes a new national program” to regulate SO_x- and NO_x-related acidic deposition. *Id.* at 158.

The Senate Report on the 1990 Act, in a section entitled “Need for measures beyond the current Clean Air Act,” adopts an EPA analysis concluding that the Agency did not have authority under the NAAQS program to address NO_x and SO_x-related acidic deposition. S. Rep.

No. 101-228 at 289-90 (1989) (“Some have suggested that the existing law is adequate to deal with interstate air pollution. The most persuasive argument that it is not, is the EPA’s own analysis of the options available under existing law.”). Because Congress determined that the Agency lacked authority to regulate acidification caused by NO_x and SO_x deposition, it enacted Title IV “for the express purpose of reducing the emission, transport, transformation and deposition of acid rain precursors, sulfur dioxide and oxides of nitrogen.” *Id.* at 302. The legislative history, therefore, confirms that Congress viewed Title IV as the sole authority for regulatory action to address acidification. Indeed, if EPA’s new interpretation of its authority were correct, these reports should have indicated that Congress amended the 302(h) definition of welfare for the express purpose of addressing acidification. Clearly, that was not what Congress intended. Moreover, had Congress intended in amending § 302(h) to authorize regulation of NO_x- and SO_x-related acidification pursuant to the secondary NAAQS program, it stands to reason that Congress would have also amended the secondary NAAQS program so as to redress what Congress and EPA both concluded was a program that was not designed to handle an issue with the specific features of acidification. Congress did nothing to reconfigure the operation of the secondary NAAQS in this manner. Thus, it cannot have intended that EPA proceed with acidification-based regulation of NO_x and SO_x.

To summarize, Congress enacted a comprehensive program specifically designed to address NO_x- and SO_x-related acidification. A general authorization to address welfare effects is not sufficient to overcome the presumption against reading general statutory authorizations to supersede more specific enactments. Further, § 404 confirms that Congress intended any additional regulation of acidification to be addressed by the legislature and did not leave the

matter to EPA discretion. The legislative history of the 1990 Act supports this interpretation of the law.

And, indeed, that is the interpretation the Agency accepted until this misguided attempt to rewrite the Act was initiated. The Agency previously made the following statements:

- “[B]oth bodies of Congress . . . *conclude[d]* that a new legislative program was *needed* to address acidic deposition effects despite significant uncertainties concerning underlying scientific data and arguments over whether the EPA could address the acidic deposition problem under existing law.” 58 Fed. Reg. 21,351, 21,356/2 (April 21, 1993) (emphasis added).
- “The 1990 Amendments and the legislative history indicate, however, that Congress *reserved judgment* as to whether further action might be necessary or appropriate in the longer term and, if so, what form it should take. *Congress seems to have viewed these as questions it would itself address in the future*, based on further studies and research to be conducted by the EPA and other agencies. Consistent with the 1988 proposal notice, *Congress does not seem to have expected that the EPA would set a secondary standard for acidic deposition . . . in the interim*. To the contrary, in section 404 of the 1990 Amendments, Congress specifically required the EPA to conduct a study of the feasibility and effectiveness of an acid deposition standard or standards, and to report to Congress by November 15, 1993 on the role that a deposition standard might play in supplementing the acidic deposition control program adopted in title IV, and what measures would be needed to integrate it with that program.” *Id.* (emphasis added) (citation omitted).
- “Based on its review of options, the Administration had concluded that existing authorities under the Act, including those for secondary NAAQS and the associated implementation process, *were not well designed to address regional air pollution problems, especially those involving long-range transport of pollutants and their transformation products. The President accordingly decided that a comprehensive program aimed at reducing SO₂ emissions . . . would be the best way to afford increased protection [from acidification]*.” 58 Fed. Reg. at 21,356/1 (emphasis added).
- “Congress *reserved judgment* regarding the possible need for further action to control acid deposition beyond the provisions of title IV of the 1990 Amendments and what form any such action might take.” 60 Fed. Reg. 52,874, 52,884/2 (Oct. 11, 1995) (citing § 404 of the 1990 Act) (emphasis added).

The bases for these statements are reflected in EPA’s 1995 report in response to § 404.

Acid Rain Div., U.S. EPA, Acid Deposition Standard Feasibility Study: Report to Congress

(1995) [hereinafter “404 Study”]. The 404 Study provided an assessment of different methods for regulating acidifying deposition effectively. Tellingly, none of the approaches the Agency concluded was feasible bore any resemblance to a secondary NAAQS. Although the 404 Study did not include a definitive statement like those quoted above that the Agency lacked authority to regulate acidification under other authorities, it concluded that “clear direction from Congress in this area would certainly make implementation more feasible and effective.” *Id.* It further noted that the “uncertainties” of the NAAQS program would not be “conducive” to the sort of planning required for acidification-related regulation. *Id.* at 101. In sum, the comprehensive Title IV program for addressing acidification has been viewed by EPA for years as the only proper authority for addressing this issue. The Agency has similarly concluded that the NAAQS program is fundamentally ill-suited to addressing NO_x- and SO_x- related acidification. Nothing has changed to alter any of those conclusions. The PA and the standard it supports are therefore premised on an incorrect interpretation of the law. The Agency has no authority to regulate NO_x and SO_x in the manner recommended by EPA staff in the PA, and accordingly, the document is fundamentally flawed and cannot support a revision to the NAAQS.

V. A Secondary NAAQS Is Required by Law To Specify a Nationally-Uniform Level for Air Quality and To Express This Requirement in Terms of the Minimally Acceptable Concentrations of NO_x and SO_x in Ambient Air.

As described above, the Agency had, until this review, maintained that secondary NAAQS were an improper vehicle for addressing NO_x- and SO_x-related acidification and that the features of the NAAQS program were fundamentally ill-suited to the problems posed by acidifying deposition. Specifically, significant regional variation in depositional loadings and ecosystem sensitivity to acidification had been deemed insurmountable obstacles to an appropriate NAAQS based on protection from acidification effects. UARG agrees and sees no justification for EPA to change its assessment now.

The laws governing the structure and form of the NAAQS have not changed in any way so as to alleviate any of these previously-recognized problems. EPA staff has, however, attempted to mask them through the development of what it terms an “Atmospheric Acidification Potential Index,” or AAPI, for a joint NO_x and SO_x secondary NAAQS. Through the use of this AAPI, EPA staff asserts that it has overcome the problems posed by using the NAAQS to address acidification. In reality, though, the AAPI is nothing more than an attempt to rewrite the basic parameters of a NAAQS and to obfuscate the fact that this new standard would be inconsistent with the CAA.

EPA staff explains the AAPI, in general terms, as follows:

The AAPI is essentially a function that determines the allowable levels of ambient NO_y [NO_x] and SO_x based on the target ANC [acid neutralizing capacity] limit, given uncertainties in the parameters used to calculate an ANC equivalent at the national scale, and weighing other factors such as time to recovery for ecosystems, based on populations of catchments that represent acid-sensitive areas in the U.S. The AAPI is designed to be a more ecologically relevant form of the standard relative to the current form. The intent of the AAPI is to weight atmospheric concentrations of NO_x and SO_x by their propensity to contribute to acidification through deposition, given the fundamental acidifying potential of each pollutant, and the ecological factors that govern acid sensitivity in different ecosystems, as well as the contribution of reduced nitrogen.

PA at 5-9.

In essence, then, the AAPI is an equation that relates a specific target ANC level in water bodies, to be selected by the Administrator, to a range of acceptable ambient concentrations of NO_x and SO_x, while taking into account various ecosystem features that influence the effect of acidifying deposition on an ecosystem’s sensitivity and recovery potential. An AAPI NAAQS is, therefore, a fundamentally new approach to regulating air quality under the NAAQS program.

Indeed, EPA staff acknowledges the radical nature of the shift recommended in the PA:

In this review, EPA is also attempting to develop a standard that takes into account the variability in effects from ambient levels of NO_x and SO_x. The CAA requires EPA to establish “national” standards, based on the air quality criteria that provide the requisite degree of protection, but does not clearly address how to do so under the circumstances present here. One approach is to develop a secondary standard such as the one discussed in this Policy Assessment Document. Such a standard is designed to provide a generally uniform degree of protection throughout the country by *allowing for varying concentrations of allowable ambient NO_x and SO_x*, depending on atmospheric conditions and other variabilities, to achieve that degree of protection.

PA at 1-20 (emphasis added).

This cursory discussion and limited justification fails to establish that an AAPI NAAQS would be consistent with the Act. In fact, the AAPI envisioned by the EPA staff would violate fundamental attributes that any secondary NAAQS must possess. As noted above, “[a]ny [secondary] *national* ambient air quality standard ... *shall specify a level of air quality* the attainment and maintenance of which in the judgment of the Administrator, based on such criteria, is *requisite to protect the public welfare* from any known or anticipated adverse effects associated with the presence of such air pollutant in the ambient air.” CAA § 109(b)(2) (emphasis added). Specifically, a NAAQS specifies a *single* level of air quality and this single level of air quality must apply to the entire *nation*. By EPA staff’s own admission, an AAPI standard would satisfy neither of these requirements.

That an AAPI will fail to specify a single air quality level is, ironically, a primary reason the Staff recommends it. As the PA explains, an AAPI is set based on a target ANC level, a measure of water quality, chosen to protect a selected percentage of aquatic ecosystems. PA at ES-8. Thus, the proposed AAPI approach would seek to substitute a single level of water quality applicable to the nation for the uniform level of air quality required by the Act. Indeed, the

AAPAPI equation will be used to translate this single measure of water quality into *ranges of acceptable NOx and SOx concentrations*, reflecting possible tradeoffs between NOx and SOx reductions to reach the target ANC and differing ecological conditions geographically. The failure of an AAPAPI to specify nationally-uniform air quality demonstrates just how far EPA staff has strayed from what is permissible under the Act.

EPA staff attempts to justify the AAPAPI NAAQS by comparing it to the current proposal to use PM₁₀ as the indicator of health effects of PM_{10-2.5}, as discussed in the 2010 2nd Draft Policy Assessment for the review of the PM NAAQS. This comparison fails to justify an AAPAPI NAAQS. The PM₁₀ standard specifies a single nationally-applicable level of minimally acceptable concentrations of an air pollutant in ambient air. As described above, a standard based on the AAPAPI would not.

Finally the regulatory approach described in the PA is novel not only because it attempts to translate a non-air quality indicator (ANC) into geographically variable ambient air quality levels, it also represents EPA's first attempt to set a single NAAQS for more than one pollutant. Just as the AAPAPI concept violates basic requirements for a NAAQS, so would the NOx and SOx reduction tradeoff curves EPA staff proposes for consideration. As stated, a NAAQS must "specify a level of air quality" that is nationally applicable and that is "requisite to protect the public welfare" from the adverse effects associated with the presence "of such pollutant in the ambient air." Thus, under the CAA, each criteria air pollutant must be assigned a single, nationally-applicable minimally acceptable ambient concentration level. The joint standard envisioned by EPA Staff, however, is designed to allow for multiple minimally acceptable

concentration levels of each pollutant.⁸ Accordingly, the recommended joint standard would also result in a violation of § 109(b)(2). EPA staff should reconsider this course of action and substantially revise the PA in light of the inherent flaws in the approach that has been pursued.

In sum, the AAPI standard EPA staff recommends the Administrator consider would result in nationally-variable acceptable concentrations of NO_x and SO_x in the ambient air and would violate the CAA requirement that a NAAQS prescribe a single level of atmospheric concentrations of a criteria air pollutant. EPA is not free to rewrite the fundamental requirements of the CAA to address a problem in a manner that falls outside the bounds of its CAA authorities. Because the fundamental features of a NAAQS are not compatible with the policy goal of regulating NO_x and SO_x-related acidification, the only reasonable conclusion is that applying the program to such ecosystem impacts is inconsistent with the program and must be rejected.

VI. The AAPI Standard Described in the PA Suffers from Numerous Critical Scientific and Technical Shortcomings.

Every NAAQS review requires a substantial scientific and technical assessment to support any action to revise a standard. That is especially the case when the Agency staff is exploring a revision as novel and untested as the one recommended in this PA. The present PA, however, suffers from numerous scientific and technical shortcomings. Many of these shortcomings have been brought to the attention of the Agency and CASAC Panel charged with reviewing the PA, and they have caused concern among members of the Panel. Some of the most critical issues include:

⁸ Indeed, it is clear that EPA staff is recommending this standard for NO_x and SO_x, in part, for the express purpose of regulating the effects of a non-criteria pollutant, reduced nitrogen (“NH_x”). Such action, as discussed further below, is also inappropriate.

- The Lack of a Quantitative Uncertainty Analysis:** The CASAC NO_x and SO_x Secondary NAAQS Panel has informed EPA that a quantitative uncertainty analysis is a critical component to the review of the NO_x and SO_x standard EPA staff is pursuing. Agency staff has failed to undertake such an analysis and has instead suggested that such an undertaking is too complex for the Agency to conduct. The Electric Power Research Institute (“EPRI”) has, however, performed such an analysis. The results of the EPRI analysis demonstrate that the uncertainty inherent in EPA’s approach to estimating critical loads and relating them to atmospheric concentrations of NO_x and SO_x is so large that the Agency cannot reasonably define a requisite level for a secondary NAAQS. The Agency staff’s conclusion that uncertainties are small is thus unfounded, and the basis for the staff’s preferred approach is therefore highly questionable.
- Shortcomings in the Models EPA Has Employed:** EPA is relying on several models, such as CMAQ and MAGIC, to develop the NO_x and SO_x tradeoff curves that would be used to implement an AAPI NAAQS. EPA has not verified the performance of these models for the uses to which the Agency has put them. Moreover, EPRI has demonstrated that there are profound doubts as to the ability of these models to successfully simulate relevant factors and conditions. This casts considerable doubt on the reasonableness of EPA staff’s proposed approach and unlike other past NAAQS that establish attainment/nonattainment based on measurements, the AAPI NAAQS tradeoff curves will rely almost entirely on models for such designations. Given the underlying importance of models to the basis for the AAPI tradeoff curves and the likely permanency of their results (i.e., the models will likely be applied only once), the model applications must receive heightened scrutiny and not be simply adopted from applications of opportunity.
- Critical Components of the AAPI Remain Unexamined:** As explained above, the AAPI is a complex equation that relates a selected ANC to a range of ambient NO_x and SO_x concentrations while taking into account various ecosystem features that influence ecosystem response to acidic deposition. The number and precise functioning of these various ecosystem features is a highly complex issue in its own right. Some of these critical factors are not even addressed in the AAPI. That Index either fails, for instance, to take into account or treats too simplistically base cation weathering, base cation exchange, and base cation deposition to name only a few. Similarly, the AAPI assumes that deposition to concentration ratios are constant, which they are not. Further, the AAPI’s treatments of nitrogen uptake and sulfate retention are both flawed.
- Inadequate Screening Criteria for Naturally Acidic Lakes:** EPA staff acknowledges that the NAAQS under consideration should exclude naturally acidic lakes from considerations in setting an adequately protective standard. The Agency has selected screening factors in an attempt to exclude these water bodies. The selected factors are, however, too simplistic. Lakes in Florida, for instance, have low ANC, low DOC, and low Al but still have thriving fisheries due to other ecosystem features. EPA’s screening criteria using a DOC threshold would fail to exclude these lakes when they should be.

- **Unclear Derivation of AAPI Elements:** Based on the information EPA staff has presented, it remains unclear how an AAPI for a given water body has been developed or even where the input data are obtained, a key issue to the rationale behind attainment and nonattainment designations. The geographic scope and representativeness of the water bodies taken into consideration in assessing each state's degree of attainment are, for instance, unclear. Further, to what extent are these various inputs based on modeled versus measured values or on site-specific or extrapolated values?
- **Unknown Effect of the Contemplated Standard:** Unlike in other NAAQS reviews, EPA staff has failed to analyze the impact of its contemplated standard. Not only is it unclear what parts of the nation will be designated attainment and nonattainment based on EPA's analysis, it is similarly unknown whether the contemplated NAAQS would result in changes in water body ANC sufficient to bring an area into attainment. Nor is it clear what period of time would be required for such a change in conditions to occur as a result of decreases in deposition brought about by the NAAQS. Further, EPA staff has failed to examine the impacts on acid conditions and deposition that will result from existing regulatory programs and programs that are already scheduled to be put into place.

These various technical issues are of enormous importance. Individually, each one of these matters is the source of large uncertainties and requires evaluation before a NAAQS could reasonably be determined to be appropriate. Taken as a whole, the lack of detail and certainty on these core issues reveals that the Agency is totally unprepared to complete the Policy Assessment phase of this NAAQS review.

VII. The PA Omits Information Vital to the Evaluation of the Standard It Proposes for Consideration and That Is Otherwise Relevant to This Review of the Secondary NAAQS for NO_x and SO_x.

As stated in the introduction to the PA, the document "is intended to help 'bridge the gap' between the scientific assessment contained in the ISA and the judgments required of the EPA Administrator in determining whether it is appropriate to retain or revise the secondary NAAQS for NO_x and SO_x." PA at 1-2. As explained in greater detail below, the information presented in the PA is wholly inadequate to that purpose. Significant issues have yet to be addressed, even though the Agency should have assessed them thoroughly in earlier stages of this NAAQS review. That they remain absent from this draft and will only be included, if at all, after the close

of the public comment period is entirely unacceptable. Thus, not only must EPA incorporate significant new material into the PA, it should release an additional draft of the document to allow for public comment on those matters that the Agency has yet to address.

A. The PA Does Not Adequately Develop Information Relevant to the Implementation of the AAPI Standard in Contrast to Other NAAQS Reviews.

Although the PA contains a great deal of information and many novel analyses, it strangely continues to omit analysis of some of the most crucial issues facing the Administrator as she examines the adequacy of the current NAAQS⁹ and weighs the policy options presented to her by her staff. First, the PA provides no clear explanation of how attainment and nonattainment areas would be determined for the standard under consideration. The document discusses ecoregions in the context of determining representative catchments for purposes of deciding upon adequate protection levels for the standards. It is not clear, however, how, if at all, this ecoregion concept might be translated into a basis for defining compliance areas under the Act.

Further, the basis for the states to recommend attainment and nonattainment designations and the extent of each such area remain unexplored. The CAA, under § 107(d)(1)(A), requires the Governor of each state, within a period of time no longer than one year from the date on which a new or revised NAAQS is promulgated, to submit recommended designations to the

⁹ EPA also appears to be considering retaining the current secondary NO_x and SO_x NAAQS. The Agency has not presented an analysis as to the level of protection against direct phytotoxicity effects that would be afforded as a result of the adoption of an AAPI standard such as those described in the PA. Yet, at the October 6 and 7, 2010 CASAC Panel meeting, EPA staff suggested that it might nevertheless be appropriate to retain the existing secondary NAAQS for NO_x and SO_x. In the absence of an analysis of the protection that would be afforded by an AAPI standard, however, the Agency has no basis for concluding that retaining the current NAAQS is “requisite” to protect the public welfare. Absent such analysis, the Administrator cannot make the determinations required of her by law.

Administrator. Given the absence of adequate monitoring data, which would typically serve as the basis for designation recommendations,¹⁰ it is unclear how states would be expected to prepare and submit their § 107(d)(1)(A) recommendations. Indeed, there is some indication in the PA that EPA itself may usurp this state role. By failing to address this issue, EPA is creating considerable uncertainty and potentially setting the stage for major problems in the future.

Further, there is no indication how attainment will be demonstrated, and the time frame for attaining compliance is similarly undefined. This sort of analysis has been included as a matter of course in NAAQS reviews and should be presented in the PA.

The PA also lacks any indication as to what portions of the nation would likely attain or fail to attain the contemplated AAPI standard at varying levels of target ANC and with various other options for the elements of the standard. It is not sufficient for the Agency simply to assert that these are implementation issues that are irrelevant to standard setting. This information is certainly relevant to putting the stringency of a contemplated NAAQS into context. Further, it can clarify the sort of protection provided by various standard levels and the relationship of other standard elements to the stringency of a particular suite of controls. If this information were not relevant to the review of a NAAQS, it would not be presented in the risk and exposure assessments and policy assessments prepared as a matter of course in other NAAQS reviews. EPA staff must provide this information during this review as well.

B. The PA Fails To Provide a Basis Upon Which to Assess a Reasonable Percentage of Water Bodies That Should Be Protected by the NAAQS Under Consideration.

Should the Administrator choose to pursue an AAPI standard to protect against acidification of water bodies despite the serious issues discussed above concerning the legality of

¹⁰ It is not even clear what type of monitoring would be required. Air quality monitoring? Water quality monitoring?

any such standard, the Administrator will be faced with deciding what percentage of water bodies should receive protection under such a standard. The PA is the obvious location for a thorough analysis of the issues relevant to this determination. The current draft PA, however, contains less than a page of analysis of this issue and indicates that additional analysis will be presented in the final document. EPA staff is significantly impeding public review of this issue by excluding relevant information until after the public's ability to comment on the document has closed.

Moreover, there is some basis for concern over the approach EPA staff may be contemplating. As noted by CASAC Panel Member Rich Poirot at the October 6, and 7 CASAC Panel Meeting, EPA staff appears to be pursuing an inherently arbitrary process for selecting an appropriate percentage of water bodies to protect from acidification effects. The PA must provide a thorough, well-reasoned basis for the Administrator's assessment of these issues. As it stands, the PA provides nothing to assist in this determination.

C. The PA Fails To Address the Beneficent Effects of NO_x and SO_x Deposition.

As stated in the PA, "this review is focusing on effects in sensitive unmanaged ecosystems (not commercial forests or agricultural lands) resulting from ambient concentrations of NO_x and SO_x through deposition of N and S." PA at 1-21. The document goes on, however, to acknowledge that "a certain amount of NO_y deposition in managed terrestrial ecosystems may have a beneficial effect, specifically increased growth (a fertilization effect). However no attempt has been made to quantify those beneficial effects since this document and preceding analyses are focused on unmanaged sensitive ecosystems." PA at 3-25. Efforts to quantify these beneficial effects are required.

Similarly, as noted by CASAC Panel member Dale Johnson, EPA has repeatedly ignored recommendations that the relationship between N-enrichment, plant growth, and carbon

sequestration be examined in the PA. EPA staff has done nothing other than to state that “[f]orests also play an important role in carbon sequestration at both regional and global scales. The total value of these ecosystem services is very difficult to quantify.” PA at 3-33 to 3-34. This level of analysis is simply insufficient.

EPA is obligated to consider beneficent effects. The U.S. Court of Appeals for the District of Columbia Circuit has expressly held that, when evaluating a NAAQS, EPA is to examine and base its decisions regarding the standard on the beneficent effects that might also be associated with the pollutant in addition to any adverse effects. Specifically, the Court concluded that the CAA requires EPA to consider both adverse and beneficent effects of pollutants and to assess “net” impacts. *American Trucking Ass’n, Inc. v. EPA*, 175 F.3d 1027, 1053 (D.C. Cir. 1999), *modified on petition for reh’g en banc*, 195 F.3d 4, *rev’d in part sub nom. Whitman v. American Trucking Ass’n, Inc.*, 531 U.S. 457 (2001). Accordingly, EPA must give equal consideration to beneficent and adverse welfare effects in its assessment of what the science suggests may be an appropriate level for a NAAQS.

It is apparent that the EPA staff has not met this obligation. There is nothing in the PA that could be characterized as a balanced analysis of net impacts, taking into account benefits of nitrogen deposition. The EPA staff’s recommendation of standards in the PA is therefore based on an analysis that is lacking legally necessary components. The PA must be revised to include this sort of assessment or any standard based upon it will fail to comply with the Act.

D. The PA Fails To Address Adequately the Role of Reduced Nitrogen, Instead Shifting the Entire Regulatory Burden for NH_x-related Effects onto Airborne NO_x and SO_x.

As noted in the PA, ecosystem acidification results not only from NO_x and SO_x deposition but also from the presence of reduced nitrogen. Noting that the NO_x and SO_x NAAQS cannot “directly address reduced forms of nitrogen in the atmosphere,” the EPA staff

concludes that “it is important that the structure of the standards address the role of reduced nitrogen in determining the ecological effects resulting from deposition of atmospheric NO_x and SO_x.” PA at 4-5. The Staff’s approach for addressing the role of reduced nitrogen is not, however, an equitable one. The AAPI standard would impose more stringent controls on ambient NO_x and SO_x to offset effects of reduced nitrogen. This is an improper use of the NAAQS, and it demonstrates yet again just how misguided EPA’s contemplated regulatory approach is.¹¹

E. The PA Fails To Address Adequately Monitoring Issues Relevant to the Selection of a Standard Such as the One EPA Staff Proposes for Consideration.

A NAAQS is inseparable from the ambient monitoring techniques that are used to judge compliance with it. Thus, these techniques are specified at the time a new NAAQS is promulgated. At the October 6 and 7, 2010 meeting of the CASAC Panel charged with reviewing the PA, EPA staff stated that an investigation into monitoring and establishing a Federal Reference Method (“FRM”) and Federal Equivalence Method (“FEM”) to implement the contemplated AAPI NAAQS for NO_x and SO_x would be initiated by the CASAC Ambient Air Monitoring and Methods Subcommittee (“AAMMS”)¹² during its January 2011 meeting. According to the EPA staff, the results of the AAMMS investigation will inform the Agency’s treatment of these issues in its NAAQS Proposal, currently scheduled for release in July 2011.

¹¹ If EPA wishes to address the ecosystem impacts of reduced nitrogen, the CAA provides a process for doing so: listing of reduced nitrogen as a criteria air pollutant would need to be justified and implemented, air quality criteria would have to be prepared, and the Administrator would be required to evaluate the scientific evidence and determine whether reduced nitrogen warranted regulation under the standards of the Act.

¹² According to a Federal Register Notice published on October 20, 2010, EPA is accepting nominations to this CASAC subcommittee and upon its reconstitution, it will be renamed the Air Monitoring and Methods Subcommittee. 75 Fed. Reg. 64726.

Thus, according to the Agency's own plan, EPA will have just over 6 months within which to prepare an analysis supporting FRM and FEM designation

Chapter 8 of the PA contains the Agency staff's analysis of air monitoring issues to date. The Chapter confirms that the 6 month period the Agency hopes to use within which to resolve monitoring issues cannot possibly be adequate. Indeed, Chapter 8 only indicates that there is not a currently adequate monitoring network and does nothing to inform the selection of FRMs for implementation of the contemplated standard apart from noting that there are no FRMs for NO_Y or SO_4 and that there are considerable obstacles in establishing these FRMs. PA at 8-6, 8-8. Further, the Agency has yet to acknowledge that the standard it is contemplating during this review would require overcoming even greater obstacles than is typically the case. This results from the nature of the AAPI standard itself. Because compliance with the AAPI standard would have to be determined through application of the equation that comprises the standard, those calculations will need to be included in the FRM or FEM the Agency establishes. EPA staff should not rush such a complex and relatively novel process.

The level of work accomplished to date makes it clear that the short period of time the Agency is allotting itself to resolve these issues is inadequate. Indeed, that is the case with all of the outstanding analysis still missing from the PA. Therefore, the Agency should revise its plans for moving forward with the NAAQS review to ensure that it can actually accomplish the critical tasks before it.

VIII. Conclusion

The second draft PA does not fulfill its purpose of bridging the gap between the scientific and technical information and the policy considerations implicated in this review of the NO_x and SO_x secondary NAAQS. The document focuses on protecting against acidification, an impermissible goal. Moreover, the standard recommended in the PA does not comply with the

fundamental requirements of the Act. Further, the PA continues to omit information crucial to the review, such that it would be impossible for the Administrator to evaluate the adequacy of the existing NAAQS or to fully comprehend the import of her decisions with respect to the standard EPA staff recommends. Given the substantial revisions that are required, an additional draft should be released for public and CASAC review and comment. Absent these actions, the Administrator will not be able to rely on the PA as a basis for selecting an adequate standard.